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# GRAHAM MEETING

IN

## PROVIDENCE.

Pursuant to a public notice, given by a committee appointed by Mr. Graham's class, a meeting was held at Masonic Hall, in Providence, March 4th, 1834, composed of a large number of individuals of both sexes, who had attended the lectures of Sylvester Graham; on [the SCIENCE OF HUMAN LIFE, and who approved of his System of instruction—at which meeting, resolutions reported by the Committee, consisting of Rev. Thomas Williams, James Scott, and Stanford Newel, were unanimously adopted, as follows :

1. *Resolved*, That the Lectures which Mr. GRAHAM has delivered in this city, have not merely equalled, but highly exceeded the expectations we had formed respecting the nature, the objects and importance of his system.

2. *Resolved*, That while we are deeply sensible of the misapprehensions and misrepresentations that exist in respect to Mr. Graham, and his objects and sentiments, among persons who have not had an opportunity or an inclination to obtain information on these subjects; yet, we are persuaded that the sentiments and practices which he inculcates in his "LECTURES ON THE SCIENCE OF HUMAN LIFE," accord with the fundamental principles of physiology, and the laws of our nature, resulting from our compound and wonderful existence.

3. *Resolved*, That in our judgment, the System which Mr. Graham scientifically and experimentally illustrates and enforces, is essential to the continuance and prevalence of the reformation which has happily commenced and rapidly advances, with the progress of knowledge and virtue, liberty and happiness among mankind.

4. *Resolved, therefore*, That we cheerfully contribute our testimony, to sustain and extend the reputation of Mr. Graham, as a *Public Lecturer on the SCIENCE OF HUMAN LIFE*, from a deep solicitude that our

fellows may receive as extensively as possible, the benefits which his instructions are calculated to produce, in reference to their material, mental, and moral capacities, obligations, interests and enjoyments.

5. *Resolved*, That in acknowledgement of the benefits we have received from the Lectures of Mr. Graham, we are desirous of presenting to him some proper and permanent testimonial of our esteem, friendship, and cordial approbation of his character and conduct, as they have been publicly and privately exhibited, during his residence in this city.

6. *Resolved*, That we are persuaded that happy results will arise from a candid and rational experiment of the System which Mr. Graham enforces; of the good effects of which, in the economy of human life, there are many living and grateful witnesses.

7. *Resolved*, That the preceding resolutions be signed by the Chairman and Secretary of this meeting, and presented to Mr. Graham, and also that they be published.

A Committee was appointed to carry the fifth resolution into effect, by appropriating, under instruction, the amount subscribed.

S. NEWELL, *Chairman*.

WM. S. PATTEN, *Secretary*.

At an adjourned meeting, holden at Masonic Hall, March 15, 1834, a beautiful silver Fruit Basket, and an elegantly bound copy of Dr. Noah Webster's quarto Dictionary, were presented to Mr. Graham, in fulfilment of the above fifth resolution.

At the close of Mr. Graham's Course of Lectures in Brunswick, Maine, the meeting was called to order by Dr. Lincoln, and his Excellency, Gov. Dunlap was called to the Chair.

Professor Mussey, M. D., Prof. McKean, M. D., J. Page, M. D., I. Lincoln, M. D., S. P. Cushman, M. D., Prof. Newman, Gen. A. B. Thompson, Humphrey Purinton and Charles Thompson, Esqrs., were appointed a committee to draw up resolutions expressive of the opinion which the meeting entertained concerning the lectures delivered by Mr. Graham.

The committee having fulfilled this duty, Prof. Mussey, as chairman of the Committee, reported the following resolutions, which were



unanimously adopted, with the exception of one or two individuals, by the meeting, consisting of more than three hundred people.

*Resolved*, That we entertain a high sense of our obligations to Mr. Graham for his Lectures on the SCIENCE OF HUMAN LIFE, in which the laws of the vital economy have been explained and elucidated by a great variety of original, striking and happy illustrations.

*Resolved*, That in our judgment, the principles taught by Mr. Graham, are founded on the organization and physiological condition of the human body, and that the universal extension of them, is essential to the completion of the reformation now in progress, and to the highest earthly welfare of the human family.

JOHN COBURN, *Secretary*.

May 14th, 1834.

The undersigned, Members of the Portland Medical Association, having attended Mr. Graham's Lectures on the SCIENCE OF HUMAN LIFE, are happy to concede, that many of his most valuable doctrines are peculiarly his own, and, so far as we know, are not to be found in Medical Books, as has been asserted by many who have not attended his lectures. The assertion therefore, that Mr. Graham's Lectures are made up of materials already before the public, is, we believe, untrue.

We regard his System as embracing the very best interests of the human race ; for we cannot doubt, that if his doctrines in respect to the diet and general regimen should be universally adopted, the cause of temperance and morality would be essentially promoted, and the physician's services rarely needed.

His anatomical and physiological illustrations are entirely correct, and his demonstrations of the sympathetic relations of the organs of organic vitality are intensely interesting.

Portland July 22, 1834.

J. MERRIL, M. D.

THO'S H. MERRILL, M. D.

B. D. BARTLETT, M. D.

ELIPHALET CLARK, M. D.

TIMOTHY LITTLE, M. D.

J. W. MIGHELS, M. D.

ALBUS REA, M. D.

LUTHER ROGERS, M. D;

JOHN BARRET, M. D.



A DEFENCE  
OF THE  
GRAHAM SYSTEM OF LIVING :

OR,

REMARKS ON DIET AND REGIMEN.

---

DEDICATED TO THE RISING GENERATION.

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"Ah! in what perils is vain life engag'd!  
What slight neglects, what trivial faults destroy  
The hardiest frame! of indolence, of toil  
We die; of want, of superfluity:  
The all-surrounding heaven, the vital air,  
Is big with death."

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NEW-YORK;

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1835.



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TO THE UNPREJUDICED READER.

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SEVERAL years have now elapsed since a public Lecturer on the SCIENCE OF HUMAN LIFE, known as the Rev. Sylvester Graham, ventured to address the citizens of New-York on the interesting subject of Diet and Regimen. He endeavored to establish the proposition, that a law of relation existed between man, and every external object by which he is surrounded; and that, as a consequence, the human body could only be properly nourished by such materials as were adapted, by this law, to his organization; the violation of which induced disease, in number and variety, which terminated in death, painful and premature.

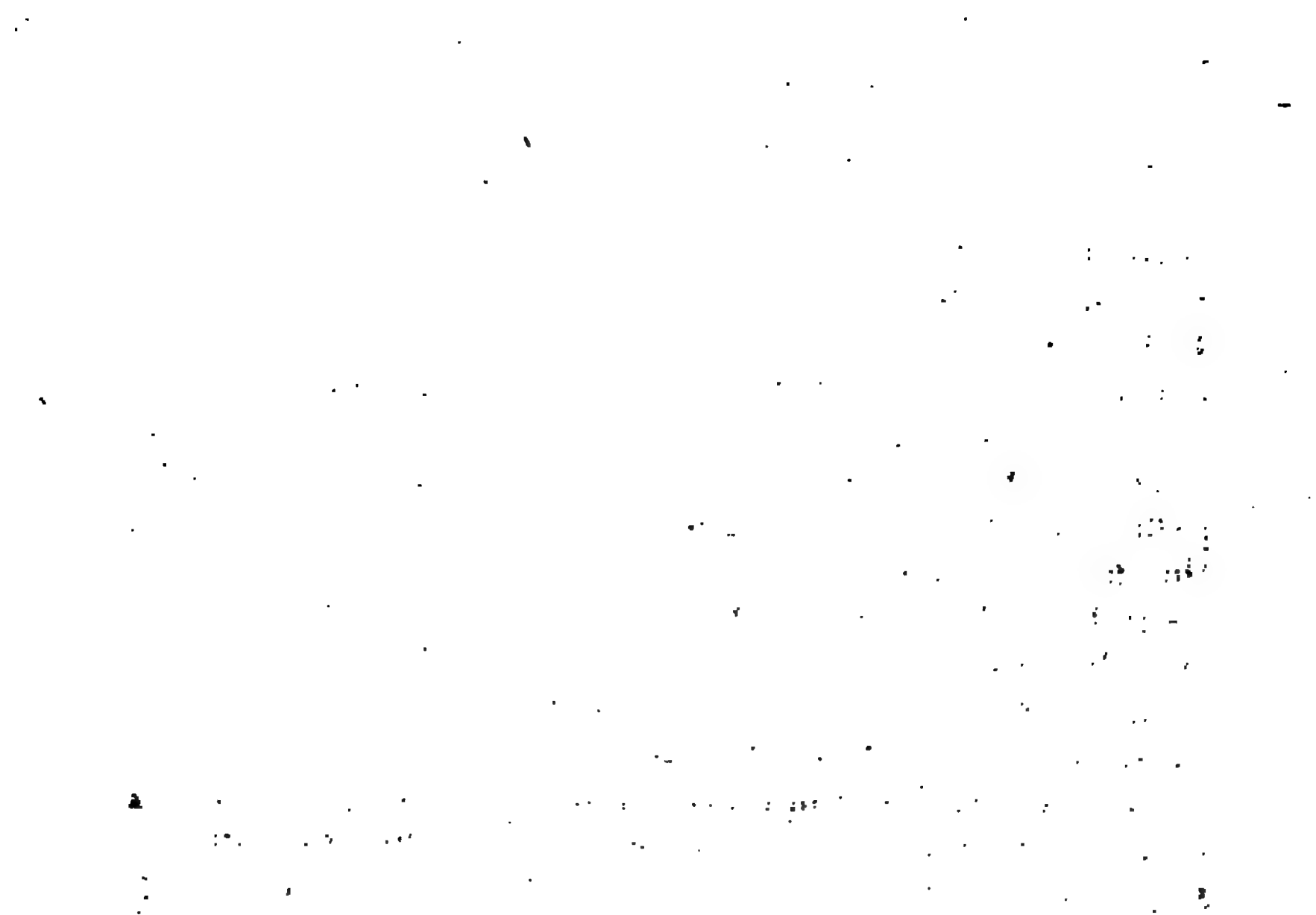
When we reflect upon the appalling fact, that sensuality is the prevailing vice of the age, and that Luxury reigns triumphant in the *civilized* world, will it appear surprising that the heterodox opinions expressed by the lecturer above alluded to, should have created an excitement in the minds of his hearers? many of whom, most probably in the enthusiasm of the moment, embraced, with ardor, a system that promised such inestimable benefits, only to relapse into their former habits, when the warmth of their zeal had abated: while others, deeply impressed with the simplicity and abstract beauty of a natural system of diet, and aware that, in point of economy, it offered the most powerful aid to the philanthropist, devoutly adopted and rigidly adhered to it. The debauchee, and the glutton, too, in numbers, who were suffering with chronic maladies, startled at the prospect of a speedy termination to their mis-spent lives, resorted to an abstemious course of life as the only means of relief; some of these have persevered, and are now restored to health, while the remainder, too far confirmed in unnatural habits to admit the continuance of a reformation, have either descended, or are fast approaching, to an untimely grave: and many more, though they acknowledged the truth of the doc-

trines advanced, yet, destitute of that moral courage so indispensable in the art of self-government, framed to themselves, and adopted, various excuses for the non-observance of dietetic rules. The great mass of the populace, however, given up, as they were, to the control of factitious appetites, could scarcely have been expected to listen to arguments proposed in defence of a system, the adoption of which would have deprived them of one of the greatest of their enjoyments, the gratification of the palate. But, there were some, who, though they could not openly refute the positions which Mr. Graham was endeavoring to maintain, took advantage of every opportunity to frustrate his efforts, by insidious attacks on his character, and expressions of doubt as to the purity of his motives. They pointed out his faults, which they wilfully exaggerated and censured, and labored, most uncharitably, to bring his doctrines into disrepute, by attaching odium to his private character; but, would it not have been more rational to have adopted that virtuous maxim, "**PRINCIPLES—NOT MEN,**" and to have refrained from associating the opinions of any individual, on an important subject, with his peculiar, and, perhaps, educational or accidental traits?

"Reformers, in all ages, whatever has been their object, have been unpitied martyrs, and the multitude have evinced a savage exultation in their sacrifice," from a principle of hostility to all innovations; more especially if they strike at the root of habits of early association, however vicious or degrading. Whether their object be pure, or otherwise, they must receive the derisions of the multitude, and be contented to submit, in silence, to a misrepresentation of motives by the selfish, and to censure and abuse from the sensual and ignorant; yet, if they persevere in their benevolent enterprises, shall they sink for want of assistance? We may reasonably trust otherwise, while there are, of the virtuous and enlightened, those who will sustain them in their noble efforts to support the cause of temperance, be its enemies, the slaves of appetite, never so busily engaged in ridiculing its doctrines, and villifying its promulgators.



It is to correct these erroneous prejudices that I have ventured to appeal to the public, by candidly stating the principal views of Mr. Gráham, on the interesting question of health and disease ; and, if I fail in the attempt, I shall still have the satisfaction, myself, of realizing that my intentions are upright, and my belief sincere ; and, under the circumstances that I offer my views and experience, I am unwilling to believe that they will not be properly appreciated. I feel, however, that my aid, in the advancement of so important an undertaking, can be but feeble ; and, for that reason, have preferred the selection of numerous extracts, from medical writers and authors of celebrity, to the production of a work entirely original, and unsupported by any other than my own authority. Relying upon the indulgence of its readers, I confidently offer this little book for their perusal, with the hope that its defects may not be too severely criticized.



**THE**  
**GRAHAM SYSTEM OF LIVING.**

---

**INTRODUCTORY REMARKS UPON THE PAST AND PRESENT  
CONDITION OF MAN.**

"He has cast nature off, which was his shield  
And nature casts him off, who is her shame."

**WHENEVER** the mind is released from the restraint imposed upon it by prejudice and public opinion, it becomes an instructive, although a melancholy occupation, to contemplate the situation of that wayward being—*man*; to observe his habits, to note his peculiarities, to investigate his social relations, and to contrast him, as he now is, with what he once was, and might have been, had he never deviated from the path of nature.

When we perceive a being, endowed with intellectual faculties of so exalted a character as to entitle him to the highest rank in the scale of animate existence—a being who can render nature's productions subservient to his will, who is capable of continued enjoyment, and who knows no real obstacle to unlimited pleasure—is it not surprising that such a being should be a solitary sufferer; that he, alone, of all the animated race should be unhappy? Can we believe that the superiority of his mind, and his more delicate and beautiful organization, subjects him to suffering and pain, inflicts upon him numerous and complicated diseases, and yields him a prey to the dominion of the wildest passions? No! philosophy never taught such a doctrine, reason rejects it, and a knowledge of natural laws, and their uniformity, forbids the conclusion. Compelled to abandon the idea, that Nature has

"on Man, alone,  
Partial, in canseless malice, wantonly  
Heap'd ruin, vice, and slavery; his soul  
Blasted with withering curses; placed afar  
The meteor happiness, that shuns his grasp,"



Where shall we seek for the cause? To what attribute the heart-rending scenes of suffering and disease that daily obtrude themselves upon our notice? Shall we be told, by the victims of gluttony and intemperance, who submit to the worst of evils under a false impression that they are the greatest of benefits—shall we be told by them that the same power which filled the world with every thing calculated to gratify the wants of man, and to contribute to his happiness, could have been so inconsistent and capricious as to counterbalance the pleasure he enjoys, with sickness and pain? Or, rather, shall we not believe, that every deviation from a strict conformity with those laws which nature first prescribed for the preservation of man, is succeeded by a punishment, proportioned to the extent and duration of such transgression? And should not every philanthropist, throughout the land, lend his aid to check the causes of human misery, when, in the precepts and examples of the resolute and good, seems to rest our only hopes of the future redemption of our almost fallen race? Alas! how often is it otherwise—how often do our pseudo-moralists weep over human frailties, lamenting the prevalence of vice, regretting that there is no remedy for crime, and ignorantly asserting the palpable error, that man, intellectual man, is naturally a depraved being.

Poets, of all ages, disgusted with the corrupt state of society, have delighted in the most romantic conceptions of primæval simplicity, and the condition of man while yet in a state of nature. Whether the original inhabitants of the earth ever deserved the encomiums that their supposed innocence, happiness, and perfect state of health, have so often elicited, we, of the present age, may have no right to assert. But the traditions of almost every nation seem to corroborate the belief, that there was a time when man was free from disease, and a perfect stranger to vice. The corruption of his nature appears to have been the result of a gradual alteration in his habits of life, and a corresponding change in the climates of the earth, produced by some violent convulsion of nature. It has been supposed that this change

occurred during a deluge, and that previous to that event there were no variations in the seasons. Deeply impressed with this belief, the poet remarks—

“The Seasons since, have, with severer sway,  
Oppressed a broken world: the Winter keen  
Shook forth his waste of snows, and Summer shot  
His pestilential heats. Great Spring, before,  
Green'd all the year; and fruits and blossoms blush'd,  
In social sweetness on the self-same bough.  
Pure was the temp'rate air; an even calm  
Perpetual reign'd, save what the zephyrs bland  
Breath'd o'er the blue expanse; for then, nor storms  
Were taught to blow, nor hurricanes to rage;  
Sound slept the waters; no sulphureous glooms  
Swell'd in the sky, and sent the lightning forth;  
While sickly damps, and cold, autumnal fogs  
Hung not, relaxing, on the springs of life.”

Perhaps the conceptions of the poet owed their origin to a belief, that no Eden could have existed where extremes of heat and cold, and sudden changes of climate, left the body a prey to those agents that are constantly tending to its destruction: what foundation he had for such belief a little observation will soon determine, since a warm and temperate climate seems more congenial to the feelings of man than the cold, damp, and changeable one in which he now exists.

Coeval, almost, with the belief in a perpetually mild and salubrious atmosphere, was the opinion, so extensively entertained, of the simplicity of diet in the primitive ages. It is supposed that man originally subsisted on those productions of the earth which grew without cultivation, and required no artificial preparation to render them adapted to the supply of his wants. From some unknown cause, however, a gradual change took place in the dietetic habits of the human race, followed by a consequent degeneracy; and now,

“These white, unblemished manners, whence  
The fabling poets took their golden age,  
Are found no more amid these iron times,  
These dregs of life.”

#### EFFECTS OF LUXURY.

WHEN Luxury, soft enervating Luxury, had once gained admission among the societies of men, she waved

her vampyre wing, and lulled her victims into a fatal security, while she employed herself in the accomplishment of their destruction. As luxury prevailed, the frugal board, once spread with nature's simple bounties, gave place to costly tables, loaded with sumptuous viands and delicacies culled from every clime. The humble cot, once the abode of innocence and peace, became abandoned for the splendid edifice, in which the votary of luxury immured himself, and would be shielded from the very air of heaven. Crowded cities next, with all their attendant vices, completed the ruin of the human family. And, from generation to generation, even to the present period, have we been perpetuating and maturing a system, formed of the most loathsome vices, and fraught, not only with the most incalculable evils to ourselves, but to our posterity, to whom, in turn, we transmit more wretchedness, and propensities far more destructive to their future happiness than those that have been entailed upon us.

When we revert to the primitive ages, we find a hardy race, blessed with an almost incredible length of years, compared with those of modern longevity—a race of beings unused to superfluities, who asked no other food than nature presented, and quenched not their thirst with a beverage prepared by art. How sadly changed! now we are *born* diseased; the very air that first expands our lungs is loaded with corruption; the unnatural nourishment of our earliest periods proves often a prolific source of suffering; swathed in bandages, and oppressed with clothing, our bodies become enfeebled and deformed; and, as we advance in years, irrational restraint subdues our physical strength, and more irrational education the energies of our minds: new luxuries are sought after; the appetite begins to fail, and those miserable palliatives, foreign spices and stimulating food, through ignorance of their ultimate effects, are employed as restoratives. These excite unnatural thirst; inebriating drinks succeed, and when intoxication supervenes, our powerless limbs are laid upon a couch of down, where broken slumber, horrid dreams, or nightmare's close embrace,

conspire to rob us of repose. Day after day we madly persevere in our destructive course, while languor, restlessness, and irritability, with a long train of nervous diseases, characterize our condition, through years of suffering and of pain, until the almost welcome moment of our dissolution arrives.

Whatever we may once have been, at a period more or less remote, it is certain, that as a nation, luxury has now destroyed our health, perverted our morals, debased our intellects, and, in its prevalence and increase, the philosopher may foresee the downfall of a people, once famed for their intelligence, their virtue, and their freedom. The duty we all owe to our fellow-beings, to society in general, and to the great cause of human emancipation from the domain of tyranny, should urge us to investigate a question that involves, in its ultimate decision, the happiness of all. To a people, jealous of their liberties, and ever ready to defend them, no sacrifices can be too great to maintain or secure them; and the most superficial observation is alone necessary to convince a reasoning being that there exists an intimate connection between luxury and slavery. Have not the annals of experience furnished us with examples of the incontrovertible truth, that the liberties of a people are invaded or subverted, in proportion as they are luxurious and effeminate?

Even a partial glance at the history of empires, and kingdoms, and republics, should satisfy the mind that their ruin and downfall have been caused by a degeneracy of manners, a looseness of morals, and a loss of physical vigor, induced during the prevalence of luxury among their inhabitants. The millions who accompanied the besotted Xerxes, in his far-famed expedition, enervated by sloth, and corrupted by luxury, did they not fail to enslave the hardy, vigorous, unpolluted free-men of Greece? But, alas! what the physical strength of their enemies could not perform, the arts and pernicious customs, which they introduced, most rapidly executed. And Greece, from a too liberal use of the spoils and wealth of the conquered Xerxes, lost that as-



cendancy she had gained over surrounding nations ; the intemperance of her sons had paralyzed her strength, and diminished that ardent love of liberty consequent upon simplicity of life, and she yielded to the Roman arms. Next, Rome herself fell, when she had attained the height of her grandeur and opulence ; means that but served to facilitate the introduction of habits, most destructive to the happiness or freedom of her citizens.

The Persian hosts, under the luxurious and effeminate Darius, submitted to the victorious arms of the Macedonian hero, who, in his turn, fell a sacrifice to the pleasures of the Circean cup ; while the wines of Capua left Hannibal a prey to the arms of Scipio, who, but for this unfortunate indulgence, might have made imperial Rome a tributary to Carthaginian prowess. And, had the Spartans adhered to their diet of black broth, and never departed from the simple manners introduced by their lawgiver, what people could have overcome them, how could they have lost their freedom, or when would their existence, as a nation, have been destroyed ?

“ Oh luxury, thou curs'd by heaven's decree,  
How ill exchang'd are things like these for thee !  
How do thy potions, with insidious joy,  
Diffuse their pleasures, only to destroy !  
Kingdoms, by thee, to sickly greatness grown,  
Boast of a florid vigor not their own ;  
At ev'ry draught more large and large they grow,  
A bloated mass of rank unwieldy woe ;  
Till sapp'd their strength, and ev'ry part unsound,  
Down, down they sink, and spread a ruin round.”

A Republic cannot long maintain its existence, while its members are under the dominion of an artificial, capricious appetite. To procure the means of gratification what crimes are not committed, what sacrifices of time and independence are not made ? And what is the result ? A degraded and servile populace, with intellects benumbed, with bodies enfeebled, and morals perverted or destroyed. Morality can scarcely exist where the people are corrupted by the arts of civic life ; it is the offspring of Liberty and Health, and perishes in a nation where its parents are supplanted by slavery and disease.

“ Crime (says SHELLEY) is madness. Madness is disease. Whenever the cause of disease shall be dis-

covered, the root, from which all vice and misery have so long overshadowed the globe, will lie bare to the axe. All the exertions of man, from that moment, may be considered as tending to the clear profit of his species. No sane mind in a sane body resolves upon a real crime. It is a man of violent passions, bloodshot eyes, and swollen veins that alone can grasp the knife of murder. The system of a simple diet promises no Utopian advantages. It is no mere reform of legislation, while the furious passions and evil propensities of the human heart, in which it had its origin, are still unassuaged. It strikes at the root of all evil, and is an experiment which may be tried with success, not alone by nations, but by small societies, families, and even individuals. In no cases has a return to vegetable diet produced the slightest injury : in most it has been attended with changes undeniably beneficial.

“Should ever a physician be born with the genius of Locke, I am persuaded that he might trace all mental and bodily derangements to our unnatural habits, as clearly as that philosopher has traced all knowledge to sensation. What prolific sources of disease are not those mineral and vegetable poisons that have been introduced for its extirpation ! How many thousands have become murderers and robbers, bigots and domestic tyrants, dissolute and abandoned adventurers, from the use of fermented liquors ; who, had they slaked their thirst only with pure water, would have lived but to diffuse the happiness of their own unperverted feelings. How many groundless opinions and absurd institutions have not received a general sanction from the sottishness and intemperance of individuals ! Who will assert, that, had the populace of Paris satisfied their hunger at the ever-furnished table of vegetable nature, they would have lent their brutal suffrage to the proscription-list of Robespierre ? Could a set of men, whose passions were not perverted by unnatural stimuli, look with coolness on an *auto da fe* ? Is it to be believed that a being of gentle feelings, rising from his meal of roots, would take delight in sports of blood ? Was Nero a man of

temperate life? Could you read calm health in his cheek, flushed with ungovernable propensities of hatred for the human race? Did Muley Ismael's pulse beat evenly, was his skin transparent, did his eyes beam with healthfulness, and its invariable concomitants, cheerfulness and benignity? Surely, the bile-suffused cheek of Bonaparte, his wrinkled brow, and yellow eye, the ceaseless inquietude of his nervous system, speak no less plainly the character of his unresting ambition, than his murders and his victories. It is impossible, had Bonaparte descended from a race of vegetable feeders, that he could have had either the inclination or the power to ascend the throne of the Bourbons. The desire of tyranny could scarcely be excited in the individual, the power to tyrannize would certainly not be delegated by a society neither frenzied by inebriation, nor rendered impotent and irrational by disease."

Other countries and former times may furnish us with examples, full, complete, and convincing; yet, why appeal to them, save as to the beacons that experience has planted on every shore and in every age, to warn deluded man of the covert rocks of luxury, on which his unfortunate progenitors have wrecked their liberties, and all that renders life endearing? While yet our own dear native land spurns the oppressor's rod, shall we not watch, with jealous eye, the slow insidious progress of luxury, lest she sap the foundation of our free institutions?

He who prophesies the loss of our national freedom, may be deemed an ill-omened bird; but, alas! it scarcely needs a wizard's foresight to predict the slow, but certain downfall of those institutions, to establish which our forefathers have bled; institutions which we all love, and in whose defence every sword would leap from its scabbard, and every arm be doubly-nerved. We fear no enemy from without—let us draw aside the flimsy curtain and exhibit an enemy within, more powerful, more confident of victory, more capable of achieving it, than the combined forces of European despots.

Behold the perfidious foe—*domestic luxury*! She has accomplished the ruin of other states—she seeks the

subversion of our own. Do we perceive it? It *has* been lamented. Do we apply a remedy? *None*. We would rather wear her chains, and toil for her advancement, than be debarred from banqueting at her table. She offers largely, she promises like a queen, but she fulfils like a traitor. The ignis-fatuus is not more false. Like the bee she has sweets, but like the bee, too, she can sting. Her grandeur is our debasement, her reign our downfall. Would we be happy? She must be abandoned. Would we be free? She must be destroyed. As a hypocrite, she should be exposed; as a tyrant, she should suffer for her enormities.

There *was* a time when the philanthropists of Europe, when the ardent apostles of liberty in every clime, hailed, with rapturous delight, the land of the free! There *was* a time when the pure and holy, of all nations, looked upon our country as an earthly paradise, as the focus from whence the light of freedom and knowledge would radiate to every portion of the globe, and arouse, from the sleep of ignorance and the stupor of slavery, those miserable wretches who had lost every attribute of man, save the external form. They have been deceived, woefully deceived. Knowledge emanates not from us to enlighten other climes, and liberty is but a word in the mouths of brawling demagogues to mislead and betray a passionate and besotted multitude. The only free constitution that governs man has become the tool and the sport of political gamblers; and the people, themselves, have degenerated into speculators and idolators of gold. Gold? Place it within their reach—with what avidity they grasp, with what firmness they hold it. All nobler sentiments, all generous impulses subside, and leave but one desire to fill the heart, one all-absorbing despicable desire, the love of gold. To over-reach their neighbors is the height of their ambition. The ties of consanguinity, the rites of hospitality, and the common sympathies of our nature weigh nothing in the scale of wealth. Our polar-star is gold. We steer by it in the voyage of life, and the last vacant gaze of the dying moment is turned upon the glittering god.



Is it the mere sordid love of gold that prompts the unceasing efforts to obtain it? Oh no! it is the love of enjoyment; and how often, in the pursuit of the means, do we lose the opportunity. Yes! the plain, unsophisticated republicans, in a land where all are free and equal, pant and pine for wealth—not for its own sake, they are not miserly, but they *do* love to lord it over their fellows; they admire splendor and ornament; they love to wear better dresses, to live in better houses, to keep better tables, and to drink better wine than their neighbors; and the republicans are proud, too; they are pleased when they can exhibit splendid equipages and numerous servants, and when they can move in circles that are not infested by the spawn of poverty. And they will tell us, too, that there is no danger in all this. Happy they! the storm is brewing, but it will not descend upon *their* heads—its wretched victims are the multitude—the gaunt and pining sons of penury, whose necks will yet become footstools for the minions of wealth. Famine shall be the portion of their wives and little ones. The poor republican shall toil for the rich one from the first dawn of light to the going down of the sun; he shall bless his benefactor for the dry crumb of bread, and at night he will sleep so sweetly! yes, his sleep will indeed be sweet, and fortunately so, else life were not endurable. Is the prophetic warning false? The groans and tears of the old world too plainly speak the irrevocable doom of the new.

Though the cheek crimson with shame when we reflect upon the degraded condition of the nation, and the heart is wrung with anguish for the sufferings of its people, there is prospect of its regeneration, there is a hope of the future happiness of its citizens: that prospect, that hope lies in the *equal dissemination of knowledge*. It is the potent wand that can convert an enslaved and wretched land into a terrestrial paradise. Bestow on the suffering many an enlightened and liberal education—giving them a knowledge of nature and of themselves, how strange the metamorphosis! plenty usurps the place of poverty; bloated intemperance fades,

and the mild and blooming cheek of health delights the eye; the miserable, vicious, filthy, drunken beings, who lived but to cast an odium upon nature, are seen no more in the happy, virtuous, intelligent, and temperate freemen, who are the pride and boast of their truly favored home.

Individuals, it is true, are often unable, by the utmost vigilance, to guard against a degree of affliction, or a series of misfortunes—occurrences often unavoidable, but most frequently arising from ignorance or an obstinate adherence to ancient prejudices. Society is generally the author of its own misery—a condition necessarily dependant upon its imperfect organization; and when man once consents to follow the simple dictates of nature, and to obey those laws so admirably adapted to the preservation of his health, liberty, and happiness, then disease and suffering will no longer be referred to a blind fatality. Then, and then only, will the millenium of the poet be realized, and phrenologists cease to declare, that vice is the result of man's organization.

To communicate to my friends what I conceive to be a proper course of life, shall be my task, and I do it with a sincere belief that rational beings need but a knowledge of the truth, to return to the long-neglected and almost forgotten path of nature. When the advantages derivable from a simple system of regimen are explained, I am confident of the co-operation of the enlightened portion of the community, and trust, that a reformation once begun will never terminate until its object be accomplished.

Setting aside the painful consequences of luxury and intemperance, the immense amount of money squandered to pamper depraved appetites, deserves our serious consideration. It has been calculated, by rigid economists, that two hours, each day, devoted to labor, would be sufficient to procure all the necessaries of life; the remaining eight, or ten, might be employed in literary pursuits, or in the acquisition of useful knowledge. But now, there seems to be a continued struggle among all classes to accumulate wealth, and hence results its une-

qual distribution, and the privations of many to augment the splendor of the few. The great majority of mankind are obliged to toil incessantly to procure a meagre subsistence, while those who perform no manual labor live in luxury and magnificence. While the present state of things endures, the rich will always oppress the poor, because they hold in their possession the means of maintaining their power.

It has long been our boast that the *people* elect their representatives, and that universal suffrage gives the poorest citizen equal power with the richest. Such is the ostensible object, but, however easy it may be in theory, we all know how difficult it is in practice. Who nominate our officers? The rich. What class of citizens generally fill those offices? The wealthy. Does every man vote according to the dictates of his judgment, and with a sincere desire to benefit his country? Let the many ignorant besotted beings, who are led in droves to the polls, to vote for some wealthy candidate, while under the influence of liquor, answer the question. Do the multitude of laws annually framed by our representatives, have a tendency to benefit the poor, or to secure them from the usurpations of the wealthy? Directly the reverse. Our laws are enacted by the rich, and made, almost exclusively, to benefit their interests. While the poor continue to expend their trifling incomes for the most pernicious luxuries, they will remain ignorant, and thus neglect the only means calculated to elevate them to an equality with their opulent neighbors.

The evils of luxury are almost incalculable. From this prolific source we derive our diseases, our deformities, our poverty, and our slavery. Avarice, and the basest passions, are generated and nourished wherever it exists; while crime and misery are its legitimate offspring. It may be asked, if mankind are in this wretched condition, why have philosophers, and statesmen, and men of science, neglected to warn the people of their situation, or failed to perceive it? Their condition has been observed, and deeply lamented; but few have dared, unassisted, to stem the wild torrent of intempe-

rance, which is fast overflowing the world ; and still fewer have had the courage to contend with the bigotry, the prejudices, and the appetites of the populace ; but now, when a simultaneous movement is making throughout the land to arrest the devastating course of intemperance, a feeble individual may raise his voice, and exert his influence, and do much to promote the general good. Man is not a being so utterly devoid of reason, nor so blindly devoted to the gratification of artificial appetites, as to refuse an attentive audience to modest, benevolent advice. It is the duty of those who have observed, who have practiced, to set a rational example to their fellow-beings, and to convince them, by every argument they can use, that the present mode of life must be abandoned, ere man can become free, virtuous, and exempt from bodily suffering.

“ Wherever our influence can be felt, it must be judiciously exerted. It must reach the young—who enter upon life with a blind deference for their seniors, and imbibe their habits long before they are able to weigh the tendencies which they exert. It must descend to the poor—who are ever ready to copy the manners and practices of those above them. It must spread round to the crowds of imitators, whose most anxious care is to *live like other people*, and who deem it a very important study to find out what is customary, without even troubling themselves to ask whether it be right or wrong.

“ Every man is a member of some little brotherhood, in which his influence will be felt, his actions imitated. It is here, that even the humblest may do much. Not by ill-timed and boisterous denunciations against all who may feel the importance of the subject less deeply than himself—but by a meek and unostentatious, yet firm and consistent rejection of those daily and nightly indulgences, which lead to the misery we deplore. He must remember that they whom he would gain over are not so wicked as they are weak ; and that it is not in the severe capacity of a judge that his labors are required, but in the more endearing character of a friend. His strongest persuasions must be those of practice.



There is 'no lecture so eloquent as the silent lesson of a spotless example.' He may not witness sudden and miraculous conversions to his faith—he may even sometimes hear the coarse taunt of the scorner against both his faith and his works.

"And now, is it a hard thing that we ask each other to perform? There are those who never fear to do that which they are conscious is wrong—shall we be afraid to do that which we know to be right? Martyrs have calmly laid their heads on the block, for opinions, the truth of which many will always deny—shall we hesitate to protest against habits, the baneful consequences of which all acknowledge? Men waste time, and talent, and money, in schemes, which, though successful, end in vexation and vanity—are we unwilling to make an effort for the happiness of those about us, which, even if unsuccessful, will bring us the reward of self-approbation? We love to remember what our fathers did and suffered, in the ages gone by, and we extol the holy and the bold achievements which secured to us a lovely heritage—shall our children look back to our day, and find nothing to reverence in us? Shall we not, at least, bequeath them lessons of purity, examples of temperance? These may not win for us the page of history—the orator may not sound our praise in high places—nor the poet remember us in his glowing anthem; but the small, sweet voice of the moralist will testify of us—the blessings of them that were ready to perish may rest upon us—we shall have that within which passeth show."

Could we look upon the infant while calmly reposing in its mother's arms, and believe that it was born with vicious propensities, with unconquerable passions, uncontrollable appetites, we might, indeed, despair of the reformation of the human family, and all that could be said in defence of temperance would be an absolute waste of words; but no reflecting mind can believe it, and the prospect of man's regeneration will kindle the enthusiasm of every ardent lover of virtue.

Let any intelligent individual survey the state of society, and he will soon discover that there is an alarming



amount of suffering exhibited among its members. Or, let the circle of his acquaintances limit his investigations, and he will arrive at a similar conclusion. He will find many of them laboring under severe diseases, some of which are of the most loathsome characters, and bespeak a people familiar with the worst vices of civilization. Unless he content himself with ascribing natural consequences to supernatural interference, he will, most probably, inquire, what is the origin of such a variety of maladies, such intense and protracted suffering, and the frequent instances of untimely deaths that every day occur?

To answer these questions would require time and experience, and would afford, to the inquirer, abundance of materials for meditation. The mind must first realize the truth of the fundamental maxim, "that every *effect* is preceded by a *cause*." Is it more rational to suppose that a man could become diseased without the agency of some material cause, than to imagine that he could break his leg and conscientiously refer the event to a supernatural cause? Should he be injured either by a burn or a wound, would he be puzzled to account for the injury? If he be troubled with a severe cough, will he not, naturally, ascribe it to improper exposure during damp weather? And would he not be disposed to laugh, if we should say that his cough was the result of a mysterious dispensation of Divine Providence? If, then, the simple suppression of perspiration can induce consumption, with every prospect of lingering death, may not our daily excesses produce derangements of other organs, terminating in diseases equally dangerous, equally fatal? If the use of improper articles of diet, and the habits of civil life, may not be cited as the cause of bodily infirmities, to what shall we attribute the variety of ailments that constantly afflict mankind? If any other cause can be assigned, it will settle a question that involves the happiness of the living, and of millions yet unborn.

The reader might consider it too presuming, if I should assert that the "Graham System of Living" was

the only one calculated to secure, to the human family, the full possession of health, vigor, and a calm contented mind ; but, I unhesitatingly offer it as my opinion, supported by many facts, that a healthy infant, *untainted by hereditary disease*—living in a mild, salubrious climate ; its muscular system invigorated and developed by natural exercise ; its mental faculties properly cultivated ; its diet of the most simple kind, in such a condition as nature presents it, unaltered by fire, and unadulterated by foreign ingredients ; a calm and uniform temper preserved ; and a strict attention to sleep, cleanliness, and clothing, and all other circumstances connected with the welfare of the being—such an infant might arrive at extreme old age, without experiencing an hour's illness, and with his faculties but little impaired. I do not say that such would invariably be the result, but I have not the slightest reason to doubt it, and, with this conviction, I am solicitous that the experiment should be fairly tried, before it is pronounced chimerical, or rejected because it denounces some of the fancied pleasures of life.

Lest I should be accused of ignorantly recommending a system of living, fraught with more evils than it is calculated to remedy, I deem it a duty to warn any one, who may be induced, by these remarks, to adopt it, that he will experience, for a limited time, a diminution of strength, (arising from the abstraction of a variety of powerful stimulants ;) if he has been more than usually addicted to the pleasures of the table, he may be overcome by debility or sickness ; but, should he ascribe these effects to the real cause, and persevere for a few months, he will find his health materially improved. It would be irrational, however, to expect, that where the system has been laboring under severe chronic complaints, that any course of living would effect an immediate cure ; when it has taken years to derange and break down the animal machinery, it is not the work of a moment to repair it ; but why despair ? It is not difficult to effect a cure ; a rigid self-denial and steady perseverance are alone requisite to restore the most wretched invalid to an enviable state of health.

If any man suppose that his enjoyments will be abridged by the plan I recommend, he is laboring under an unfortunate mistake; his appetite will become more uniform and natural; he will acquire a high relish for unstimulating food and drink, while his activity of body and energy of mind will compensate him for his abstemiousness. Let one of our modern epicures, whose organs of taste have long been excited by high-seasoned food and stimulating drink, adopt this Pythagorean regimen, and he will find that the plain, nutritious articles of diet prescribed, are quite insipid; let him continue, for a few months, until the healthy susceptibility of his nerves is restored, and he will perceive that his frugal fare is not only palatable, but agreeable. "He will find, moreover, a system of simple diet to be a system of perfect epicurism. He will no longer be incessantly occupied in blunting and destroying those organs from which he expects his gratification. On a natural system of diet, old age would be our last and our only malady; the term of our existence would be protracted; we should enjoy life, and no longer preclude others from the enjoyment of it; all sensational delights would be infinitely more exquisite and perfect. On a natural system of diet, we should require no spices from India; no wines from Portugal, Spain, France, or Madeira; none of those multitudinous articles of luxury for which every corner of the globe is rifled, and which are the causes of so much individual rivalry, such calamitous and sanguinary national disputes.

"Let not too much, however, be expected from this system. The healthiest among us is not exempt from hereditary disease. The most symmetrical, athletic, and long-lived among us, is a being inexpressibly inferior to what he would have been, had not the unnatural habits of his ancestors accumulated for him a certain portion of malady and deformity. Can a return to nature, then, instantaneously eradicate predispositions that have been slowly taking root in the silence of innumerable ages? Indubitably not. All that I contend for is, that from the moment of the relinquishing of all unnatu-



ral habits, no new disease is generated ; and that the predisposition to hereditary maladies gradually perishes for want of its accustomed supply.

“ Man, and the animals whom he has infected with his society, or depraved by his dominion, are alone diseased. The wild hog, the mouflon, the bison, and the wolf, are perfectly exempt from malady, and invariably die, either from external violence, or natural old age. But the domestic hog, the sheep, the cow, and the dog, are subject to an incredible variety of distempers : and, like the corrupters of their nature, have physicians who thrive upon their miseries.

“ What is the cause of morbid action in the animal system ? Not the air we breathe, for our fellow-denizens of nature breathe the same uninjured ; not the water we drink, if remote from the pollution of man and his inventions, for the animals drink it too ; not the earth we tread upon ; not the unobscured sight of glorious nature, in the wood, the fields, or the expanse of sky and ocean : nothing that we are or do in common with the undiseased inhabitants of the forest. Something then wherein we differ with them ; our habit of altering our food by fire, so that our appetite is no longer a just criterion for the fitness of its gratification. Except in children there remain no traces of that instinct which determines, in all other animals, what aliment is natural or otherwise.”

“ It has long been affirmed,” says DR. PARIS, “ with an air of much confidence, that the management of our diet requires not the aid of reason or philosophy, since Nature has implanted in us instincts sufficiently strong and intelligible to direct us to what is salutary, and to warn us from such aliments as are injurious. We may here observe, that man has so long forsaken the simple laws which Nature had instituted for his direction, that it is to be feared she has abandoned her charge, and left him under the control of that faithless guide and usurper, to which civilization has given dominion. Appetite, which expresses the true wants of the system, can no longer be distinguished from that feeling which induces us to prefer one species of food to another, and which

entirely depends on habit and certain associations. That the natural relations which subsist between the qualities of food and the impressions made by them on the senses, are changed or destroyed by the refinements of artificial life, is a fact supported by too many powerful arguments to refute: how many kinds of aliments, originally disagreeable, become pleasant by habit; how many substances, naturally agreeable, become disgusting from the creation of certain prejudices."

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LONGEVITY.

THE primitive inhabitants of the earth, we are informed, lived to a very advanced age. The father of the human race lived 930 years; his son, Seth, 912; Enos, 905; Cainan, 910; Jared, 962; Methusaleh, 969; and Noah, 950. These men possessed strong and vigorous constitutions, procured their subsistence from the fruits of the earth, and lived strictly in conformity with the laws of life; and being the original inhabitants of the globe, whose constitutions were not impaired by debauchery and unnatural habits, there is nothing improbable in the account. Among the lower order of animals are many species, whose existence appears to be almost as protracted. Fishes are said to live nearly a thousand years, and many varieties of birds, several centuries. Is it then improbable that man, in primæval times, whose vital energy far exceeded that of all other animals, should have lived such a length of years? Whatever may have been the cause of antediluvian longevity, the term of existence began to diminish sensibly after the flood. Shem lived but 600 years; Salah, 433; Serug, 230; Nahor, 148: and mankind have gradually degenerated, through successive ages, until they have arrived at the present standard. In modern times, however, we have seen Peter Zoten reach the age of 185 years; John Rovin, his countryman, 172, and his wife, 164; Thomas Parr, of Shropshire, England, 152, and Henry Jenkins, of Yorkshire, 169. Now to what causes are we to attribute this extraordinary longevity of mo-



dern times, even if we doubted the antediluvian account? And would we be justified in asserting that no one of the present generation could attain such longevity by proper management?

The most eminent writers on longevity agree, that those who have exceeded one hundred years, have enjoyed a good constitution from nature; that they did not attain their growth until a very advanced period of life; that they have been laborious, sober, careful to observe the strictest regimen, and kept their appetites and passions in the most complete subjection. Among these may be cited the memorable Henry Jenkins, who died at the age of 169, and whose epitaph, inscribed by Dr. Chapman on his tombstone, contains these words: "Though the partial world despised and disregarded his low birth and humble state, the equal eye of Providence beheld and blessed it with a patriarch's health and length of years, to teach mistaken man these blessings are entailed on *temperance*, a life of *labor*, and a mind of ease!"

Longevity is frequent among the various orders of the religious, whose statutes confine them to a moderate diet, and oblige them to abstain from wine and the use of meat. The primitive Christians of the East, who retired from persecutions into the deserts of Arabia and Egypt, lived healthfully and cheerfully on twelve ounces of bread per day, with mere water; with this diet, St. Anthony lived 105 years; James the Hermit, 104; Arsenius, 120; St. Epiphanius, 115; Simeon, the Stylite, 112; and Romauld, 120.

According to the author of a very curious little work entitled "An Apology for Fasting," 152 hermits, taken in all ages, and under every climate, produced a sum total of 11,589 years of life, and, consequently, an average of 76 years and a little more than three months for each; whereas the same number of Academicians, the one-half belonging to the Academy of Sciences, and the other to that of Belles-Lettres, gives only 10,511 years of life; consequently, 69 years, and a little more than two months for the mortal career of each. Now, it is well known that hermits, in general, confine them-

selves to a vegetable diet, and that of the most simple kind. The philosopher Xenophilus, who lived to a very great age, was of the Pythagorean sect. It is well known, also, that those philosophers who held the transmigration of souls, denied themselves the use of animal food, because they imagined that killing an animal would be to assassinate another self.

In the days of David, the average duration of life was seventy years; that is, in seventy years, a population equal to that then on the face of the globe, descended to the grave. Thus have they continued to degenerate even to the present time, until the average duration of human life has diminished to *thirty* years! A mistake has thus been cherished, by many authors, with respect to the meaning of the Psalmist; they contend that the term of existence is not shortened. Facts, however, are at variance with this assertion, as may be proved by any one who will examine our annual bills of mortality. Of all new-born infants, *one* out of *four* dies the first year. *Three* out of *five* only attain the fifth year, and, before the twenty-second year, *one-half* the generation is consigned to the grave. In our large cities, however, *one-half* die before they reach the *tenth* year. Such a mortality, it is evident, cannot take place without a cause, more or less remote or obscure, which a proper investigation would speedily reveal. If this alarming mortality is occasioned by something which man cannot avoid, something not connected with his own actions, why is that the ravages of death are more extensive in large cities, and in this country than in many others?

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#### DIETETIC REMARKS.

How frequently we find that ignorance remains contented with ascribing all the ills of life to a Being, whom it inconsistently alleges to love His creatures, while He yet capriciously selects a number on whom His wrath descends, and whom He precludes from the enjoyment of all the pleasures of existence. What would be our opinion of a parent who could wantonly inflict upon his

child the direst calamities, the most intense and protracted suffering—and that child, too, one whom he had dearly loved, possessed, perhaps, of every amiable and endearing quality? Universal indignation would be the reward bestowed upon the unnatural father. But the wilfully ignorant of mankind, unwilling to believe that they are the authors of their own misfortunes, charge them to a Supreme Intelligence, whose impartial eye looks upon all mankind with more than a Father's love. What right have we to seek for supernatural causes, when natural ones, amply sufficient to account for an event, may be produced?

Before we give our assent to the proposition that a Supreme Intelligence is the author of our numberless diseases, it must first be proven that no connection can be traced between disease and imprudent habits; do we not invariably find that the drunkard is afflicted with maladies that none but a drunkard ever feels? do the abstemious, temperate partakers of nature's bounties die of apoplexy? did we ever hear of laboring men writhing and groaning with gouty pangs? have we any knowledge that Russian serfs or European peasants complain of dyspeptic symptoms? who but the sedentary exhibit the hectic flush of consumption? what class of people have the fewest diseases, the inhabitants of the city or country? among whom do we find the greatest instances of longevity, the poor or the rich? do sickly parents generally give birth to healthy children? are there no diseases peculiar to the seasons? do not damp, marshy places engender fevers? is there no difference in the bill of mortality in various countries? and lastly, do we not all have occasion to observe, in the course of time, that many of our friends produce pulmonary affections by improper exposure?

“In man, the most artificial of all animals, the most exposed to all the circumstances that can act unfavorably on his frame, diseases are the most numerous; and so abundant and diversified, as to exhaust the ingenuity of the nosologist, and fatigue the memory of the physician. Perhaps nosological catalogues would afford



the most convincing argument that man has departed from the way of life to which nature had designed him; unless, indeed, it should be contended that these afflictions are a *necessary part of his nature*, a distinction from animals of which he will not be very likely to boast.

“The accumulation in large cities, the noxious effects of impure air, sedentary habits, and unwholesome employments; *the excesses in diet, the luxurious food, the heating drinks, the monstrous mixtures, and the pernicious seasonings* which *stimulate and oppress* the organs,—the unnatural activity of the great cerebral circulation, excited by the *double* impulse of our *luxurious habits* and undue *mental exertions*, of the *violent passions* which agitate and exhaust us, the anxiety, chagrin, and vexation, from which few entirely escape, and then re-acting on and disturbing the whole frame; the *delicacy and sensibility to external influences*, caused by our *heated rooms, warm clothing, inactivity*, and other indulgences, are so many fatal proofs that our most grievous ills are our own work, and might be obviated by a more *simple and uniform* way of life.”

If it be admitted that the dietetic doctrines herein taught are founded upon correct principles, those who make such admission, and neglect a reformation, have much to answer for. Is there any reasonable difference between the man who shortens his life by intemperate eating or drinking, provided he be not ignorant of their effects, and he who terminates a miserable existence by the sword or the pistol? Have we a right so to conduct as to become the victims of disease? Do we not owe a duty to ourselves, to the community at large, and to our families, that renders it criminal when we voluntarily disable ourselves from fulfilling such obligations? Is a man justified in calling his friends around a bed of sickness, robbing them of their natural repose to minister to his wants, and afflicting their minds with his situation, when he might have avoided it? And even if we have, with the most virtuous courage, corrected the abuses of our own lives, have we accomplished our duty? Is it virtuous, is it just to transmit, to posterity, the diseases

with which we, ourselves, are afflicted? Does it not devolve upon us as an imperative duty, to our progeny, to educate them in such a manner, that they may be capacitated to enjoy all the happiness, of which, by a perfection of their nature, they are susceptible? Are we not accountable for the health, morals, and happiness of our offspring? If so, are we not bound to teach them the truth with regard to their habits?

If, as I contend, health may be preserved, and longevity insured, by an attention to certain rules, and a strict conformity with natural laws, are not the causes which produce so desirable an end worthy the deliberate investigation of rational beings—beings who *are* capable of appreciating the value of time, and the pleasurable benefits that accompany such blessings? Yet I am fully aware that to attempt, in detail, a description of the proper course to be pursued, in order to preserve health and ultimately to insure longevity, is to essay an arduous enterprise, and still more discouraging, with little hope of success: for, how is it possible that beings should suffer or enjoy but by comparison? and how can they be expected to compare the state of debility, lassitude, and disease, which they now endure, with that state which can only be anticipated by considering it in a negative point of view, or as the result when all pain and sorrow should be abstracted? Nevertheless, if demonstration be required of the retrograde condition of man with regard to the extent of his life, and his bodily health, I will not refer to the ages that are past and gone, though replete with proofs; but point you to the differences that exist *now*, among the same nations, the same tribes, and even the same families, placed under different circumstances.

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In the subsequent pages, I intend to give a general Outline of Nature, including the organic and inorganic kingdoms, and the laws which govern them. In so doing, I disclaim all attempts at originality; simply presenting to the public a series of facts, in a connected form, compiled from the best authors, and suited to the



comprehension of those who may have been debarred from the advantages of a professional education. Such information cannot fail to be useful to the reader, even if he be not disposed to profit by the other portions of the work ; and, for that reason, considerable matter will be introduced, not absolutely essential to the elucidation of the prominent subject. It may be necessary for the reader frequently to refer to that part which treats of the structure and functions of the human body, to understand the remaining portions of the work ; but the advantage derived from such references will more than counterbalance the trouble by rendering him more familiar with that important study, the animal economy. At the end of the work will be found an explanation of such technical phrases as may not be explained in the text. The subject of the present volume is one that embraces the whole science of morals, and that peculiarly interesting branch of knowledge, which teaches the art of self-preservation. But this subject, so extensive in its ramifications, and so endless in its details, is merely sketched or outlined in the present volume ; and the intelligent reader will find no difficulty in filling up the outlines, either from his own experience or observations. It is a matter of the deepest astonishment and regret, that those who have called themselves philosophers, should have wasted whole years in the most trifling pursuits, in vain attempts to solve abstruse and speculative problems, while the subject under consideration, though intimately connected with the welfare of man, has been treated with unmerited neglect and contempt ; but let such philosophers remember, that “ the proper study of mankind is *man*.”

## AN OUTLINE OF NATURE.

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### ATOMIC THEORY—ASTRONOMICAL OBSERVATIONS.

EVEN during its wildest reveries, the mind shrinks back appalled from a contemplation of the universe, in its boundlessness, its sublimity, and its duration. From the minutest atom to the rolling orb whose inexhaustible supplies furnish us with heat and light, every natural object excites our surprise and elicits our admiration. So boundless, indeed, is the universe, that human imagination is inadequate to the task of conceiving its limits: nor can it realize that period when matter had not a definite existence.

Every thing that can be perceived by the senses—every thing that can be either heard, seen, tasted, or felt—every thing belonging to the animal, vegetable, and mineral kingdoms,—all have received the general appellation of *matter*.

“*Matter*, in its elementary state, consists of inconceivably minute *atoms*, so small that the corpuscles of vapor, heat, and light, are compounds of them; and so solid that they cannot possibly be broken or abraded by any concussion of violence whatever. The express figure of these primary atoms is various; there are round, square, pointed, jagged, as well as many other shapes. These shapes, however, are not diversified to infinity; but the atoms, themselves, of each existent shape, are infinite or innumerable.

“These infinite groups of atoms, flying through all time and space, in different directions, and under different laws, have interchangeably tried and exhibited every possible mode of rencounter; sometimes repelled from each other by concussion, and sometimes adhering to each other from their own jagged or pointed construction, or from the casual interstices which two or more connected atoms must produce, and which may be just adapted to those of other figures, as globular, oval, or square. Hence the origin of compound and visible bo-

dies ; hence the origin of large masses of matter ; hence, eventually, the origin of the world itself."

The ultimate particles or molecules, of which matter consists, are called *atoms*, because it is thought that they are not susceptible of division. These atoms are endowed with a power of reciprocal attraction, by which two or more of them, when placed in juxta-position, unite together. This force or property of atoms is called *cohesion*, or *cohesive attraction*, and its power may be estimated by the force which it requires to separate the particles of a body, as in iron or marble.

Although two atoms, when placed at insensible distances from each other, exert an equal force to approach and unite, yet all large bodies attract smaller ones ; and this attraction has been distinguished from *cohesion*, by the term *gravity*, or the *attraction of gravitation*. A stone thrown into the air will invariably descend toward the earth ; and the velocity with which it descends will be proportioned to the number of atoms it contains : or, in other words, a large stone is attracted more forcibly to the earth than a smaller one ; the power required to separate the stone from the surface of the earth, after it has fallen, is called its *weight*, and this, also, depends upon the number of particles it contains. If bodies smaller than the earth are attracted to its surface by the force of gravity, the earth itself is attracted toward a larger body, the sun, by a similar power ; and some philosophers have even imagined that the sun and all the planetary bodies are attracted to, and revolve around another sun, of far greater magnitude, whose fires have long since been extinguished or exhausted.

As matter never had a beginning, so it never ceases to exist. It may be dissipated by heat, but it cannot be destroyed. Water may be evaporated, but its ultimate particles are not annihilated. Wood and coals, consumed in the fire, may disappear ; but this apparent destruction is a simple change of form or composition. The atoms themselves *exist*, and enter into the composition of other bodies ; hence matter is said to be *indestructible*.

The celestial bodies, including the fixed stars and the solar system, are the largest masses of matter of which we have any knowledge. The discoveries of the telescope have shown that the heavens are filled with innumerable stars, whose distances are greater than human imagination can conceive, or human ingenuity calculate. The nearest fixed star is four hundred thousand times farther distant from our earth than the sun; and it is believed that there are some whose distance is so immense that their light has not yet reached us. It is supposed that the fixed stars are centres of innumerable worlds, which revolve around them, as our earth revolves about the sun: they are easily distinguished from the planets by their less luminous appearance, and by shining with a twinkling light. Although the number of fixed stars visible to the naked eye, at any one time, does not exceed a thousand, yet it is supposed that the number, within the range of telescopic discovery, amounts to upwards of seventy-five millions.

With our solar system, astronomers are best acquainted: it consists of the sun, and twenty-nine planetary bodies, eleven of which are called *primary*, and eighteen, *secondary planets*. The primary planets move round the sun as their common centre; while the secondary planets revolve round the primary, which they accompany in their revolution about the sun. The primary planets are situated, with respect to their distances from the sun, in the following order: Mercury, Venus, the Earth, Mars, Vesta, Juno, Ceres, Pallas, Jupiter, Saturn, and the Herschell planet, or the Georgium Sidus. Of these, our Earth is accompanied by one moon, Jupiter by four, Saturn by seven, and the Herschell planet by six. These moons are the secondary planets, which shine, as do also the primary, by reflected light.

The Sun is the largest body of which we have any definite knowledge, being *fourteen hundred thousand* times larger than the earth. It is a solid, dark body, not materially different in constitution from the earth, encompassed by a fluid mass of luminous matter, which furnishes us with light and heat.



The Asteroids, Vesta, Juno, Ceres, and Pallas, are the smallest planets in the solar system, and are confidently believed to be the remains of an ancient world, (which formerly revolved in the wide vacancy between the orbits of Mars and Jupiter) torn to pieces by some violent convulsion of nature.

The most wonderful bodies with which astronomers are acquainted, are *comets*. They are known to belong to the solar system, as the returns of some of them have been calculated; they revolve round the sun in orbits wonderfully eccentric; sometimes descending with extreme rapidity from the far distant regions of the system, displaying a long and luminous train, and after remaining visible for a time, again fly off.

The most interesting, however, of the celestial bodies, is the planet we inhabit. The Earth revolves around the sun at the mean distance of ninety-five millions of miles. It completes this revolution in a year, and turns on its axis in a day, or 24 hours.

The other planets, belonging to the solar system, present little of interest to claim our attention in a brief astronomical sketch, and the reader is referred to other works for a detailed description.

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#### THE EARTH—THEORIES OF ITS ORIGIN.

THE original formation of the earth is involved in impenetrable mystery, and vague conjectures are the only evidences we have of its origin or its age. So many theories of its origin have been discussed by geologists, that the mind is bewildered in their contemplation, and unable to decide as to their truth or falsity.

It is usual, in describing the globe, to invent, or adopt some theory that has been already invented, to account for its origin: but which, of the numbers that have been framed, shall we select? Shall we believe, with Burnet, that the earth was once a level plain; that all substances were disposed around the centre of the globe, according to their specific gravities, water every where occupying the surface; that the oily portions, floating on the top,

formed a fertile crust, on which the antediluvian generations lived in perpetual spring; and that the deluge broke through this crust, (whose raised edges form our present mountains) changing the axis of the globe, and, consequently, the temperature of its climates? Shall we imagine, with Descartes, that the earth was originally a small sun, covered with an opaque crust, which, by sinking down, gave birth to the mountains? Or, with Leibnitz, that the whole mass of the globe has been vitrified? Shall we adopt the hypothesis of Whiston, that the earth was a comet, which had forsaken its track to revolve in the orbit of a planet, and that another comet enveloped it in its tail, and deluged it by raising its waters? Shall we agree with Ray, that earthquakes heaved up the mountains, while the fluid and solid substances were separating, and that the earth emerged from the waters of the sea? Shall we adopt the wild opinion of Buffon, that a comet fell obliquely into the sun, detaching the 650 part, which separated into fragments, forming the several parts of our solar system, and which, by their rotary motion, acquired a spheroidal shape? Shall we concur with Franklin, in the opinion that all matter existed as an elastic æriform gas, irregularly diffused throughout space; that part of this air, condensing, formed the exterior crust of the globe, in whose interior is contained nothing but air? Or, shall we not rather confess our ignorance, and admit that either of these theories may be true or false?

Speculations are unprofitable when facts cannot be adduced to support or refute them; yet the propensity to account for every phenomenon seems to be a desire inherent in the human mind, and we rest satisfied with the theory if it has no other merit than that of ingenuity. Perceiving something objectionable in the various theories which have been promulgated from time to time, and so strenuously supported by their respective advocates, I venture to hazard an opinion.

I contend that space does not exist; that the ultimate atoms or elementary constituents of matter, have been continually in motion from all eternity, and were once

held in solution by caloric, or the matter of heat. These atoms, constantly approaching and receding from each other, gradually aggregated together—hence their unequal diffusion in caloric. The equilibrium once disturbed, fresh accessions of primary atoms to the millions of nuclei thus formed, increased their bulk, until the myriads of worlds, which we now see, were perfected; and these immense masses of matter, or worlds, kept asunder from each other by the antagonistic principle of caloric, continue the original motion of the primary atoms by revolving or moving around a common centre (their respective suns) to which they are attracted, and of which they would become a part, were it not for the intervention of the repulsive principle of caloric.

Thus the origin of the world: its own constituent atoms, while yet in a liquid state, attracted to their individual nucleus, or centre, by the force of *gravitation*, gave to the earth a globular shape, which its rotary motion preserved. This mutual attraction gradually forced to the surface those portions of caloric which the approximation of the atoms had displaced. Thus the interior of the earth became more dense. The external surface was still a liquid mass, a portion of which the disengaged caloric converted into an elastic gas, constituting our present atmosphere. Successive depositions of this liquid matter produced the various earths and primitive rocks. The lapse of ages witnessed other important changes. The unequal distribution of caloric was in direct opposition to its natural tendency to diffuse itself throughout all matter; and volcanoes became the outlets of its excess. To these volcanic eruptions may be attributed the present irregular appearance of the external crust of the earth, diversified by mountains, and valleys, and immense collections of water. At length succeeded the phenomena of vegetation and animal life.

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#### STRUCTURE OF THE EARTH.

THE external crust of the earth, so far as it has been examined, is composed of various substances, denomi-



nated *minerals*, which are arranged in layers or strata. These minerals are divided into five classes.

The first class contains the *primitive* rocks, such as granite, gneiss, mica, slate, limestone, &c. Their texture is more or less crystalline, and they are totally destitute of organic remains or petrifications.

The second class contains the *transition* or intermediate rocks, composed of the newest of the primitive and the oldest of the secondary rocks. Their texture is partly crystalline and partly earthy, and some of them contain petrifications.

The third class comprises the *secondary* rocks, whose texture is more or less earthy, being fragments of primitive rocks united by some cement. They are supposed to have been formed after the primitive rocks, containing, and sometimes almost wholly composed of animal and vegetable remains.

The *alluvial deposits* constitute the fourth class, and are formed by the disintegration of rocks and simple minerals, combined with decomposed animal and vegetable remains. The alluvial deposits consist of gravel, sand, clay, loam, peat, bog iron ore, &c. and comprehend a very large portion of the earth's surface.

The fifth class is composed of *volcanic productions*.

Nine simple minerals, quartz, feldspar, mica, hornblende, lime, argillite (common slate), gypsum, talc, and chlorite, are supposed, by geologists, to be the elementary substances of which all rocks are composed. Quartz and feldspar are the most common as well as the most abundant materials which compose the solid masses of our globe. Of the highest and most extensive mountains upon the earth, they are the principal, and, to some extent, the only ingredients. They enter largely into the composition of the various soils, the fertility of which depends upon their proper mixture.

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#### ELEMENTS OF MATTER.

EARTH, air, fire, and water, were once thought to be simple elementary substances; but the experiments of



modern chemistry, prove that three of these supposed simple substances are compounds of several others. Thus, *water* is a compound of two gases, oxygen and hydrogen—*atmospheric air* is composed of several different gases, oxygen, nitrogen, &c.—*earth* contains clay, lime, silex, &c

There are, at present, fifty-three elementary substances, not including the *imponderables*; which last are three in number—caloric, light, and electricity, and are called imponderables because their accumulation in any body, or their subtraction from it, neither adds to nor diminishes its weight. The elementary bodies include four gases—oxygen, hydrogen, nitrogen, and chlorine; eight non-metallic bodies—carbon, sulphur, phosphorus, boron, selenium, iodine, bromine, and fluorine; and forty-one metallic bodies,—platinum, gold, mercury, lead, &c. Future discoveries, it is more than probable, will considerably reduce the number of elementary substances, by proving that some of them, now considered as simple are compound bodies; so that the whole number may not, in reality, be more than three or four.

Thus we see that the whole earth, including animals and vegetables, is formed by the different proportions and arrangement of fifty-three simples or elements!

The atoms, arranged in various ways, produce various modifications of matter; upon this depends the color, odor, taste, and other properties of bodies.

The proportion of atoms creates a considerable difference in the nature of compound bodies. For example, one atom of common quicksilver or mercury combined with one atom of chlorine gas constitutes *calomel*; another atom of chlorine gas, added to the calomel, changes it into *corrosive sublimate*, a fatal poison. The *diamond* is pure carbon; the addition of a little oxygen converts it into *charcoal*. *Water* is a compound of two gases, oxygen and hydrogen; by the addition of carbon it becomes *sugar*. A comparison between three familiar articles—sugar, starch, and alcohol—will illustrate the present point. One hundred parts of each, contain—

Of Sugar,			Of Starch,			Of Alcohol,		
Oxygen,	- - -	50.80	Oxygen,	- - -	49.68	Oxygen,	- - -	34.79
Carbon,	- - -	49.85	Carbon,	- - -	43.55	Carbon,	- - -	52.17
Hydrogen,	- - -	6.35	Hydrogen,	- - -	6.77	Hydrogen,	- - -	13.04
<hr/>			<hr/>			<hr/>		
100			100			100		

An excess of one element, or a deficiency of another, may alter a nutritious article of diet into a deadly poison. Many of our most active medicines are compounded of the same elements which enter into the composition of the air we breathe, the water we drink, and the food we eat.

Caloric, or the matter of heat, by diffusing itself among the primary atoms, renders bodies solid, liquid, or gaseous. When these atoms are closely compacted, and but little caloric between them, they produce those kind of substances which are called solid, such as stones and metals; when the atoms are loose, and move about among themselves, with a larger quantity of caloric interposed, they become liquid, as water, oil, &c. and a still greater quantity of caloric converts them into vapors and gases.

“In one mode of combination, the primary atoms form earth; in another, air; and in another, fire. Arranged in one way, they produce vegetation and irritability; in another, animal life and perception.

“The world, thus generated, is perpetually sustained by the application of fresh tides of elementary atoms, flying with inconceivable rapidity through all the infinity of space, invisible from their minuteness, and occupying the posts of those that are as perpetually flying off. Yet nothing is eternal or immutable but these elementary seeds or atoms themselves. The compound forms of matter are continually decomposing and dissolving into their original corpuscles; to this there is no exception: minerals, vegetables, and animals, are in this respect, all alike, when they lose their present make, perishing for ever, and new combinations proceeding from the matter into which they dissolve. But the world itself is a compound though not an organized being; sustained and nourished, like organized beings, from the material pabulum that floats through the void of infinity. The

world itself must, therefore, in the same manner, perish : it had a beginning, and it will have an end. Its present crisis will be decomposed ; it will return to its original, its elementary atoms ; and new worlds will arise from its destruction."

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CALORIC.

CALORIC, or the matter of heat,\* is a subtle material fluid, pervading all bodies. It is the most abundant, as well as the most important of natural agents. It performs a conspicuous part in every phenomenon of nature, and to its influence is man indebted for almost every blessing he enjoys.

Caloric is the mighty antagonist of all other forms of matter ; it insinuates itself between their particles, and overcomes the tendency which they manifest to unite and form an impervious solid. It is called an imponderable substance, because a body undergoes no appreciable change of weight, either by its addition or abstraction ; and this arises from the fact, that the atoms of ponderable matter have a mutual tendency or inclination to cohere together, while the particles of caloric neither attract each other, nor are they attracted by any other particles of matter, but seek to diffuse themselves equally through all bodies, as the particles of water pervade a sponge. The tendency which caloric manifests to preserve an equilibrium, produces all the important operations which we daily witness. Winter and summer, spring and autumn, the cooling breezes and refreshing showers, and various other phenomena depend upon the operation of this principle or tendency of caloric. Examples of this tendency to equilibrium all of us have witnessed. If the hand be placed upon a cold bar of iron, particles of caloric leave the hand and enter the iron, until both possess an equal temperature. If the iron be thrust among burning coals, it becomes equally

\* Philosophers, to avoid confusion, have adopted the word CALORIC to signify the cause of heat ; or, in other words, the term HEAT is used to express the sensation we experience on touching a hot body, and the term CALORIC implies the cause of that sensation.



red-hot, and if plunged in a basin of cold water, it parts with its excess of caloric to the water. If a red-hot ball be suspended in the air, it radiates its caloric until the surrounding atmosphere and the ball acquire the same temperature.

But all substances do not part with their caloric, nor receive it from other bodies in the same space of time. "If one end of a rod of iron be held in the fire, a hand grasping the other soon feels the heat coming through it. Through a similar rod of glass the transmission of heat is much slower, and through one of wood it is slower still. The hand would be burned by the iron, before it felt warmth in the wood, although the inner end were blazing." Those bodies which allow caloric to pass freely through them are called *conductors*, and those which do not give an easy passage to it are called *non-conductors*. In proportion to the density or weight of bodies, is the power of conducting caloric. All heavy bodies, such as the metals, conduct it with great rapidity; while lighter substances, such as wood and charcoal, (and air, when not in motion,) conduct it very slowly. We judge of the comparative warmth or coldness of bodies by the sensation they excite when touched by the hand; but "the sense of touch is a very fallacious test of heat and cold; and hence, on applying the hand to various contiguous objects, we are very apt to form wrong notions of their temperature. The carpet will feel nearly as warm as the hand; a book will feel cool, the table will feel cold, the marble chimney-piece colder, and the candle-stick colder still; yet, a thermometer applied to them will stand in all at nearly the same elevation. They are all colder than the hand; but those that carry away caloric most rapidly, excite the strongest sensation of cold.

"The phenomena that may be ascribed to the agency of caloric, and which may therefore be enumerated as its effects, are numerous. With respect to animals, it is the cause of the feelings of cold, agreeable warmth, and burning, according to its intensity. It excites the system powerfully, and without a certain degree of it,



the vital actions would entirely cease. Over the vegetable world its influence is obvious to every eye. By its stimulus, co-operating with air and moisture, the seed bursts its envelope, and yields a new plant, the buds open, the leaves expand, and the fruit arrives at maturity. With the declining temperature of the seasons, the circulation of the sap ceases, and the plant remains torpid till it is again excited by the stimulus of caloric."

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#### ORGANIC AND INORGANIC BODIES—VEGETABLES.

HAVING considered the origin, structure, and elementary composition of the earth, we ascend in the scale of nature to the first link in the chain of life.

All bodies upon the surface of the earth are divided into organic and inorganic. Vegetables and animals are called organic, because they are so constructed that certain parts or organs perform particular functions; or, in other words, their constituent elements are so arranged as to produce the phenomenon of life. Minerals are termed inorganic, because their particles are not so arranged as to perform any particular functions, being a mere aggregation of homogeneous particles. The differences between organic and inorganic bodies are very apparent.

Organic beings have their origin from similarly organized beings—they grow and are nourished by food—their parts or organs are developed by exercise and increase in bulk—and, finally, they die.

Inorganic bodies, on the contrary, have no birth—they are not nourished by food—they grow by accretion, or the addition of particles to their external surface—they are not developed by exercise, but are wasted by friction and use—they do not die, but are worn or destroyed by extraneous agents.

The first division of organized beings, comprises the different varieties in the vegetable kingdom. The study of vegetable nature is rendered interesting by reason of its close relation with animal life. Vegetables furnish us with most of the necessaries and many of the luxu-

ries of life, such as food, clothing, and fuel; they also furnish us with materials for building, and constructing the various implements of art.

Vegetables are insensible organized bodies. They are called insensible because they have no nervous system. They originate from seeds, roots, or slips, and are nourished from the soil in which they grow. When a plant originates from seed, the process is called *germination*.

If we examine a *bean*, or any similar seed, we will find, after removing its covering, or skin, that it can be separated into two halves, each of which is called a *cotyledon* or *seed-lobe*. Between these *lobes* may be discovered a small sprout, which is called the *germ*, and is the point from which the life and organization of the future plant originates. In the *germ*, two parts, the *radicle* and *plumula* may be observed. The *radicle* is first protruded, and descends into the earth, constituting the *root* of the plant. The *plumula* expands into a tuft of young leaves, and with the young stem, if there be any, rises into the air. The *cotyledons* or *seed-lobes* afford nourishment to the young plant, until its organization is so far advanced that it may draw materials for its growth from other sources. The seed of the herbs are not divided into lobes. Moisture, a certain degree of warmth, and the presence of air, are indispensable to the germination of the plant; but light retards the process. A seed germinates most perfectly, if placed a few inches under ground, and loosely covered with earth; the ground is warmed by absorbing the rays of the sun, and while its porosity gives free access to the air, it excludes the light, and is moistened by occasional showers.

Vegetables are nourished by water, earth, light, and air, and between them and animals there exists a striking analogy of the digestive functions. The root supplies the place of a stomach by imbibing nutritious juices from the soil, which, under the name of *sap*, ascends through the wood in a distinct system of tubes called the *common* vessels, which are distributed in minute ramifications over the surface of the leaves. The *sap*, in

its passage through the leaves, which are the lungs of a plant, becomes fully exposed to the action of light and air, experiencing a change which adapts it to the wants of the vegetable economy. The sap then descends through the inner layer of the bark, in another system of tubes called the *proper* vessels, yielding to the plant peculiar juices, and supplying materials for its growth and nourishment.

The temperature of the air alone limits the extent of vegetation. It is most luxuriant in the tropics, and least abundant in the polar regions. Vegetation experiences no other obstacles than extreme cold and the absence of humidity. To the want of moisture may be ascribed the perpetual sterility of the sandy deserts under the equator. Plants vegetate in eternal snow, upon the borders of hot springs, and in the craters of volcanoes. The lichens and mosses, almost destitute of roots, flourish upon the driest rocks; the sea-weeds, fuci and ulvæ, live in the bosom of the ocean, and the cryptogamic plants ramify upon the dark vaults of mines, and the walls of the deepest caverns.

Vegetables are chiefly composed of oxygen, carbon, and hydrogen; but the narcotic or poisonous are found to contain a small portion of nitrogen as a constituent principle. Potassa, soda, lime, magnesia, silex, alumina, sulphur, iron, &c. are sometimes found in small quantities, although they are supposed to be frequently the product of decomposition.

From various experiments, it is rendered probable that water and air are the chief substances that afford nourishment to vegetables—the earth being only the medium of its conveyance to the roots. In the hot-houses of the Edinburgh botanical garden, two plants, species of the fig tree, have been suspended in the air for nearly ten years, during which time they have continued to send out shoots and leaves. Sprigs of peppermint were found, by Saussure, to vegetate in pure distilled water. Tillet has raised gramineous plants in pounded glass, by feeding them with water. Braconnot has found mustard-seed to germinate, grow, and produce



plants that came to maturity, flowered, and ripened their seeds, in litharge, flowers of sulphur, and very small unglazed shot. Duhamel and Bonnet supported plants with moss, and fed them with water, the fruit and flowers of which were highly flavored and odoriferous. Hyacinths and other bulbous plants are daily raised in saucers or bottles of water. Van Helmont planted a willow tree, weighing fifty pounds, in a certain quantity of earth, covered with sheet-lead; he watered it for five years with distilled water; at the end of that time the tree weighed one hundred and sixty-nine pounds three ounces, and the earth in which it vegetated was found to have suffered a loss of no more than three ounces.

The relations existing between vegetables and the digestive functions of the human body will be explained in another part of the work.

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ANIMALS.

ANIMALS are sensible organized beings. They are called sensible because they possess nervous systems. "They are at first attached to a body similar in form to their own, but which was developed before them—in a word, to a *parent*. So long as the offspring has no independent existence but participates in that of its parent, it is called a *germ*, or embryo; this primitive adhesion to a similar being is a rule without exception.

"Every organized being re-produces others that are similar to itself, otherwise, death, being a necessary consequence of life, the species would become extinct.

"The developement of organized beings is more or less rapid, and more or less extended, as circumstances are more or less favorable. Heat, the abundance and species of nutriment, with other causes, exercise great influence, and this influence may extend to the whole body in general, or to certain organs in particular: and thence arises the impossibility of a perfect similitude between the offspring and parent."

Animals, being destitute of roots to absorb nourishment from the earth, have been supplied with an interna.



tube, or alimentary canal, open at both extremities, in which their food is placed, digested, and appropriated to the renovation and growth of the body. They derive their nourishment only from substances which have once possessed life.

“In the polypus we find only the essential parts of animal existence. The simplicity of its organization is such, that it may be turned inside out, and the external be made the internal surface; the phenomena of nutrition, which are the whole life of the animal, go on, from the close analogy between the two surfaces. There is no organ especially allotted to the reproduction of the kind. Moisture, oozing from the internal surface of the digestive tube, softens and digests the aliments which it finds there; the whole mass draws in nourishment from it; the tube then spontaneously contracts, and casts out the residue of digestion. The mutual independence of parts is absolute and perfect: cut the creature into many pieces, it is reproduced in every piece, for each becomes a new polypus, organized and living, like that to which it originally belonged. The polypi enjoy, in a higher degree than plants, the faculties of feeling and of self-motion; their substance dilates, and lengthens, and contracts, according to the impressions they receive. Nevertheless, these spontaneous movements do not suppose, any more than those of the *mimosa* (sensitive plant), the existence of reflection and will.

“From this first degree of the animal scale, let us now ascend to worms. We have no longer a mere animated pulp, shaped into an alimentary tube,—but contractile fibres, nervous ramifications, and imperfect respiratory organs, exhibiting an organization further advanced, and more perfect: sensibility and contractility are more distinct; the motions are no longer absolutely automatic; there are some that seem to suppose choice. The worm, too, may be divided (though not so often as the polypus) into many pieces; each will become a separate and perfect worm, with a head and tail.

“The crustaceous tribes, and among them the lobster, discover a more complex apparatus of organization.

Here you will find distinct muscles, an external articulated skeleton, distinct nerves, a spinal marrow, and a brain and heart: these two organs, though imperfect, assign the animal to an order much above that of worms. The phenomena of life are linked together by a strict necessity: it is no longer possible to separate the creature into two parts, each of which may continue to live. If you take off a claw, another will eventually supply its place, but the animal cannot be mutilated, so as to injure the central organs, without destroying life.

“If from white-blooded animals we go on to the red and cold-blooded, such as fishes and reptiles, we see this power of reproduction becoming more and more limited, and life more involved in organization. In fact, if you cut off a part of the body of a fish, the tail of a serpent, or the foot of a frog, the separated parts are either not supplied at all, or very imperfectly reproduced. All these creatures maintain, with the medium in which they live, relations of more strict dependence. Gills in these, lungs in others, are added to a heart, nor are less essential to life. However, the action of these chief organs is not so frequent, nor of momentary necessity for the continuance of life. The serpent passes long winters, torpid with cold, in holes where he has no air, without breathing, without any motion of life, and to all appearance, dead. These creatures, like all reptiles, are able to breathe only at long intervals, and to suspend, for a time, the admission of air, without risking their existence. Here, the vital powers are distinct and strong, and differ from those of the more perfect animals, and of man, by very slight shades. The heart and vessels of the fish feel and act within him without his consciousness: further, he has senses, nerves, and a brain; muscles and hard parts, by the action of which he moves and changes his place, adapting himself to the relations that subsist between the substances around him and his own peculiar mode of existence.

“We are come, at last, to the red and warm-blooded animals, at the head of which are the mammiferæ and man. They are entirely alike, save some slight differ-

ences in the less essential organs. There is none that has not the vertebral column, four limbs, a brain which fills exactly the cavity of the skull, a spinal marrow, nerves of two sort, five senses, muscles partly obedient to the will, partly independent in their action; and a long digestive tube coiled upon itself, furnished at its mouth with agents of saliva and mastication; vessels and lymphatic glands, arteries and veins, a heart with two auricles and ventricles, and lobular lungs. None of their organs live but while they partake in the general action of the system, and while they are under the influence of the heart: all die, irrecoverably, when they are separated from the body of the animal, and are in no way replaced."\*

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## NATURAL HISTORY OF MAN.

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### ERECT ATTITUDE.

As every thing connected with the history of man must be peculiarly interesting to ourselves, a brief description of his organization and habits, and the varieties of his race, cannot fail to attract our attention.

In modern times, philosophers have endeavored to create a belief that man was designed, by nature, to go on all fours, and that he was naturally furnished with a tail, which has unaccountably disappeared during the progress of civilization, and that mankind are, in fact, only a better kind of monkeys. Such degrading comparisons, having excited a proportionate disgust, induced many of our ablest naturalists to vindicate the superiority of man, and to assert that the erect attitude is peculiar to himself.

Without resorting to the reports of travellers, who have never met with any individuals of a nation who had adopted the attitude of quadrupeds, the general mechanism of the skeleton will furnish conclusive evidence that the erect attitude which man assumes, is the natural one.

\* A. Richerand.



“The foot of man is very different from that of the monkey; it is large; the leg bears vertically upon it; the heel is expanded beneath; the toes are short, and but slightly flexible; the great toe, longer and larger than the rest, is placed on the same line with, and cannot be opposed to them. This foot, then, is peculiarly well adapted to support the body; but cannot be used for seizing and climbing, and as the hands are not calculated for walking, Man is the only true bi-manous (two handed) and bi-ped (two footed) animal.

“The whole body of Man is arranged with a view to a vertical position. His feet furnish him with a more extensive base than that of any other of the Mammalia. His pelvis is wider, hence a greater separation of the thighs and feet, and that pyramidal form of the body so favorable to equilibrium.

“Were he to desire it, Man could not, with convenience, walk on all fours; his short and nearly inflexible foot, and his long thigh, would bring the knee to the ground; his widely separated shoulders and his arms, too far extended from the median line, would ill support the upper portion of the body. His head is also heavier than that of quadrupeds, both from the magnitude of the brain and the smallness of the cavities or *sinuses* of the bones; and yet the means of supporting it are weaker, for he has neither cervical ligament, nor are his vertebræ (back-bones) so arranged as to prevent their flexure forwards; the result of this would be that he could only keep his head in the same line with the spine, and then his eyes and mouth being directed toward the earth, he could not see before him; in the erect position, on the contrary, the arrangement of these organs is every way perfect.

“Man, then, is formed for an erect position only. He thus preserves the entire use of his hands for the arts, while his organs of sense are most favorably situated for observation.

“Although there appears to be but one human species, since all its individuals can couple promiscuously, so as to produce a prolific offspring, we yet remark in



it certain hereditary conformations, which constitute what are called *races*. Of them there are three which are eminently distinct in appearance : they are, the White or Caucasian ; the Yellow or Mongolian ; the Negro or Ethiopian.

“The Caucasian race, to which we belong, is distinguished by the beautiful oval form of the head ; and it is this race which has given birth to the most civilized nations, and to those which have generally ruled over the others. It has some differences in the shade of the complexion, and in the color of the hair. This race is called Caucasian, because tradition and also the lineage of nations, would appear to trace it to the group of mountains situated between the Caspian and the Black seas (on the borders of Europe,) from whence it has radiated in every direction.

“The Mongolian is known by its prominent cheek bones, flat face, narrow and oblique eyes, straight and black hair, thin beard, and olive complexion. It has formed vast empires in China and Japan, and has sometimes extended its conquests on this side of the Great Desert ; but its civilization has remained stationary.

“The Negro race is confined to the south of Mount Atlas ; its complexion is black, its hair woolly, its skull compressed, and its nose flattish ; its prominent mouth and thick lips make it manifestly approach the monkey tribe ; the people which compose this tribe have always remained in a state of barbarism.”\*

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#### STRUCTURE OF MAN.

A CHEMICAL analysis of the human body demonstrates only a few elementary principles ; but we are yet ignorant of the manner in which these elementary atoms combine in the formation of blood, or in the transformation of the blood into muscles, nerves, bones, tendons, ligaments, and all the varied tissues of the body. Water enters into the organization, and constitutes three-fourths, while oxygen, hydrogen, nitrogen, carbon, lime,

\* *Regne Animal*, par M. le Chev. Cuvier, tom. 1.

iron, phosphorus, and a few of the neutral salts, constitute the remaining fourth of the elementary tissues. The primitive *tissues* of the body are reduced to three—the *cellular*, the *muscular*, and the *nervous*.

The *cellular* tissue may be considered as the framework of the body. It is composed of numberless small fibres and laminæ, variously interwoven, so as to form little cells that communicate with each other, but varying in shape and size. If we could remove every other portion of the body, the cellular tissue would present the appearance of a transparent sponge, of the size and shape of the body, which its elasticity retains within certain limits. When condensed, this substance forms the principal bulk of the tendons, ligaments, nails, and hair; when indurated by the accumulation of earthy matter, bones are the result; as a thin membranous expansion it serves as sheaths for the muscular fibres; rolled into cylinders, it forms those tubes called *vessels*. It fills up the interstices between the muscles and other parts which lie near together; it gives the whole surface of the body a beautiful rounded outline, and is found in abundance wherever there is any necessity for accommodation to variations of capacity or pressure.

The *muscular*, or *fleshy* tissue, is an arrangement of parallel fibres, easily recognized as the red or fleshy portions of the animal. When these fibres are examined attentively, they will be found to be thus arranged: a small fibre is enveloped in cellular tissue; another is likewise enveloped, and the two, lying parallel with each other, are both surrounded by cellular substance. When a bundle of these are completely enclosed and separated from the rest, in a cellular sheath, they constitute what is called a *muscle*.

The *nervous* tissue includes the brain, spinal marrow, and the nerves proceeding from them. It is composed of *medullary* matter, a soft, whitish, pulpy substance, which has the power of transmitting impressions that are made on it, from one part to another. Its properties, and the nervous functions, will be more fully described hereafter.

"Thus the whole body consists of solids and fluids. The solids, when unravelled, consist of fibres, of laminae, and of molecules. The fluids are so abundant, that when they evaporate by exposure to the air, nearly all parts of the body, except the skeleton, lose from one-half to two-thirds of their original bulk, and some parts even more. The several solid parts of the body are then kept literally soaked during life in the fluids, which have, for a principal constituent, simply water."

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OF THE OSSEOUS OR BONY SYSTEM.

"The skeleton is the bony frame-work of the human body, which, by its hardness and form, retains in its proper shape the whole fabric; affords points for the attachment of muscles; and protects many of the viscera.

"The number of the bones is commonly the same in every middle-aged person, but they are less numerous than in the infant, from several of them having been originally formed in pieces. There are two hundred and eleven bones, not including those of the tympanum and the teeth.

"The bones, under every modification of shape and mechanical arrangement, are constituted by precisely the same elementary matters, the principal of which are, an animal and an earthy substance, in intimate combination. The earthy matter gives to bones their hardness and want of flexibility."

The skeleton is divided into the *head*, the *trunk*, and the *extremities*. The *head* includes the *skull* and the *face*. The *skull* is a large bony cavity, composed of eight bones, united together by *sutures*. A *suture* is the union of two bones, whose edges are usually serrated like the teeth of a saw. The *skull* is formed of eight bones—one *os frontis* or bone of the forehead; two *parietal* or side bones; one *occipital* or posterior bone of the head; two *temporal* or temple bones; one *ethmoid* bone, so called because it resembles a sieve, situated at the root or top of the nose, and enclosed in the *os frontis*; and one *sphenoid* or wedge-like bone, at the base or bottom



of the skull. The skull contains the *brain*, and gives passage to the *spinal marrow*, through a hole situated in its lower part, where it proceeds from the brain and goes through the back-bone.

There are fourteen bones of the *face*, the arrangement of which is so complicated as not to be easily described; they are united by sutures, and, when taken together, give the general shape and constitute the features of the countenance. Of the fourteen bones of the face, two belong to the upper jaw, and are called the *superior maxillæ*; one constitutes the lower jaw, and is called the *inferior maxilla*; two cheek bones, (*ossa malarum*); two *ossa palati*, or palate bones, which form the roof of the mouth; two *ossa nasi*, or bones of the nose, which are so applied to each other as to form a strong arch called the bridge of the nose; one *os vomer*, a bone which separates one nostril from the other; two *inferior spongy*, also belonging to the nose; and two *unguiform* bones, belonging to the eyes. In addition to the bones already mentioned, there is one belonging to the tongue, eight small ones to the ear, and thirty-two teeth. The head is placed on the top of the back-bone or vertebral column.

The *trunk* is constituted by the *spine* (or back-bone), the *thorax* (or chest), and the *pelvis* (or hips).

The back-bone is the chief support of the trunk, and is composed of twenty-four *vertebræ*, placed one above another, so as to form a kind of pillar or column. There are seven *vertebræ* to the neck, called *cervical*; twelve to the thorax, called *dorsal*; and five to the loins, called *lumbar*. The spinal column rests upon a bone called *os sacrum*, which is terminated by the *os coccygis*, corresponding to the tails of animals. The *vertebræ* increase in size from above, downwards, so that the *vertebræ* of the loins are larger, thicker, and stronger than those of the back and neck. A *vertebra* consists in a *body*, in seven *processes* or protuberances, and in a hollow for lodging the spinal marrow. The *body* of a *vertebra* is a solid cylindrical piece of bone, united to the bodies of those above and below, by a strong elastic substance called *cartilage* or *gristle*. The processes, both behind



and at the side of the vertebræ, are arched over, and so connected as to form a hole or canal, beginning in the first bone of the spine and terminating in the one at the extremity of the column. This canal contains the *spinal nerve* or *marrow*; between the vertebræ, on each side of the body, are smaller holes, through which branches of the spinal nerve are sent out to different parts of the body.

The *thorax* (or chest) is a large cavity containing the heart and lungs, and separated from another cavity, the *abdomen* (or belly) by a muscular membrane, called the *diaphragm* or *midriff*. The *thorax* is formed by the union of twenty-four ribs (twelve on each side) with the *dorsal* vertebræ behind, and the *sternum* (or breast-bone) in front. Fourteen of the ribs are joined to the breast-bone by means of *cartilage* or gristle, and are called *true* ribs, while the remaining ten are called *false* ribs, because their cartilages are not united with the *sternum* or breast-bone.

Two bones, the *ossa innominata*, usually termed *hip-bones*, by uniting behind with the bone at the bottom of the spinal column, and connected in front with each other, form a sort of basin, called the *pelvis*. This basin constitutes the floor, the diaphragm the roof, and the lumbar vertebræ behind, with the skin, fat, and muscles in front, the walls of a large cavity called the *abdomen* or belly. This cavity contains the stomach, intestines, liver, kidneys, &c.

The limbs of man are called his *extremities*. The arms are the *upper* extremities; each of which consists of thirty-two bones: this portion of the skeleton, on either side of the body, is divided into the *shoulder*, *arm*, *fore-arm*, and *hand*.

The *shoulder* consists of two bones, the *clavicle* or collar-bone, and the *scapula* or shoulder-blade.

The *arm* extends from the shoulder to the elbow, and has but one bone in it, the *os humeri*.

The *fore-arm* is placed between the elbow and the wrist, consists in two straight parallel bones, the *ulna* and the *radius*; the *ulna* is on the same side with the

little finger, and the *radius* is on the same side with the thumb.

The *hand* consists of *carpus*, *metacarpus*, and *phalanges*, and has, in its composition, twenty-seven bones. The *carpus* or wrist, is composed of eight small irregular bones, arranged in two rows. The *metacarpus* is situated between the wrist and the bones of the fingers and thumb. It consists of five bones, one for the thumb and one for each finger. Each finger has three bones in it called *phalanges*, and the thumb two: the relative size of each bone may be seen by bending the fingers.

The *lower* extremities are the *thighs*, *legs*, and *feet*, consisting of sixty bones, thirty on each side. The *os femoris* is the only bone in the thigh, and extends from the trunk to the leg. It is the longest, largest, and the strongest bone in the skeleton, and is connected above with one of the hip-bones, by means of a large round head, which is received into a socket of corresponding size, forming the hip-joint.

Two parallel bones, the *tibia* and the *fibula*, form the *leg*, and extend from the thigh to the foot. The *tibia* is at the inside of the leg, and the *fibula* or shin-bone is at the outside. Between the upper end of the *tibia* and the lower end of the thigh-bone, is placed the *patella* or knee-pan, in a cavity called the knee-joint.

The *foot* terminates the lower extremity. It is divided into *tarsus*, *metatarsus*, and *phalanges*. The *tarsus* or ankle, is composed of seven distinct bones, the *os calcis*, the *astragalus*, the *naviculare*, the *cuboides*, the *cuneiforme externum*, *medium*, and *internum*: the *os calcis* projects behind to form the heel. The *metatarsus* has five bones, and is situated between the ankle and toes. The great toe has two *phalanges*, and each of the other toes have three. Eight little bones are occasionally found, called *sesamoid*, two at the bottom of each great toe, and two on the under surface of each thumb.

The bones are tied together by means of firm, white, fibrous substances, called ligaments. Their strength may be estimated, when it is recollected that the executioner has been obliged to cut them with a knife, in

order to assist in the disarticulation of the bones, while four horses have been employed to tear asunder the limbs of a criminal.

The surfaces of those bones which move upon one another, are covered by a smooth, white, and polished substance (*cartilage* or gristle), which is moistened by a fluid called *synovia*, from its resemblance to the white of an egg. This *synovial fluid* is applied to prevent friction, and answers the same purpose which oil does to machinery. By this arrangement, when we raise an arm or lift a leg, the bones move easily upon one another; without which provision, every movement of the body would be attended with a harsh, disagreeable noise, the motions themselves would be executed slowly, and the constant rubbing of the bones together would soon destroy their usefulness.

*Cartilage* may be recognized by its whiteness, its flexibility, its elasticity, and by a hardness only a little inferior to that of the bones. Wherever two bones are not united by sutures, cartilage is always found between them. The *septum* which divides one nostril from the other, at the lower part, is cartilage. It is also found in the space between the ribs and breast-bone, in the wind-pipe, in the internal ear, and elsewhere.

All the bones, with the exception of the teeth, are covered by muscles, fat, and skin.

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#### OF THE MUSCULAR OR FIBROUS SYSTEM.

MUSCLES are the red, fleshy parts of animals; the redness is owing to the blood which they contain. The muscles are bundles of fleshy fibres, surrounded by their appropriate sheaths, or envelopes of cellular substance. The ultimate muscular fibre, or that which is not susceptible of division without a breach of substance, is a series of globules, resembling the globules of blood deprived of coloring matter, and adhering to each other; or it may be compared to a string of globular beads. Each muscular fibre (accompanied by a nerve, artery, and vein,) is covered with cellular tissue, and a bundle

of them, arranged in a parallel manner, and enveloped in thicker layers of cellular membrane, constitute a *muscle*.

The muscles effect locomotion by alternately approximating the different bones, to whose surfaces and extremities they are attached. They are divided into *voluntary* and *involuntary*. The *voluntary* muscles are under the influence of the will, and are generally such as serve for locomotion and speech. The *involuntary* are independent of the will, and are concerned in the functions of digestion, respiration, and circulation. The voluntary muscles are sometimes called the muscles of *animal life*; by their means we maintain a relation with the world around us, and are enabled to express our thoughts and sensations, and to procure materials for the growth and nourishment of the body; while the involuntary (sometimes called *hollow* or *organic* muscles) are directly concerned in converting those materials into the several tissues of the body. They are plentifully supplied with nerves and blood-vessels.

Muscles are generally much thicker in the middle than at their extremities. Every muscle consists in a belly and two extremities; the middle or fleshy portion is its *belly*, and the extremities are the two ends, one of which is the *head* or *origin*, and the other the *tail* or *insertion*. The muscle, which is thick and fleshy in the middle, gradually tapers toward each end until it terminates in a strong, compact, white, and shining cord, called a *tendon* or *sinew*. The end of the tendon which is termed its *origin*, is attached to the bone that remains stationary, while the other end (its *insertion*) is fixed to the bone which it is designed to move. In speaking of the attachments of a muscle, anatomists say that it *arises* from that bone which remains stationary when the muscle contracts, and that it is *inserted* into the bone which it moves.

The most singular, and, at the same time, the most important property of the muscular fibre, is its *contractility*. Whenever we move a limb, the muscle *contracts*; it shortens, swells in the middle, and becomes hard. If



we wish to raise the arm, for example, the following are the phenomena which occur. A muscle called the *Deltoides*, because it is shaped like a triangle, has its *head* or *origin* attached, partly to the collar-bone, and to the shoulder-blade, and is *inserted* in the *os humerus*, or bone of the upper arm. At the moment when we will to raise the arm, the muscle is stimulated by the nerve which communicates between it and the brain; the muscle immediately swells in the middle, and its two ends are brought nearer to each other, drawing the arm with it toward the head. The arm being now raised, we desire to bring it back to its original position—this is effected by two other muscles which draw the arm downwards. Upon this single property of the muscular fibre, to wit, *contractility*, depends the strength of the body, and the power to execute all the complicated motions of which the organs are capable. The rapidity with which contraction may take place, is manifested in speaking, in running, and in playing upon a stringed instrument; and its strength by the immense burdens that some persons can raise and bear.

The *contractility* of a muscle depends upon the stimulus applied to it. Whether this stimulus be a nervous fluid, or electricity, or any other agent, physiologists have not yet decided. It is certain, however, that the *nerves* are the chief agents in transmitting this stimulus, whatever it may be, to the muscle. If the nerves going from the brain to a voluntary muscle be divided or compressed, in any part of the course, the will has no further power over the muscle while the nerves are in such condition. If the arteries be tied so that the muscles are not duly supplied with blood, or, if the veins be tied to prevent its return from the muscles, their contractility is soon extinct.

After a stimulus has been applied for some time to a muscle, its *contraction* ceases, even though the stimulus continues to be applied. This is not only the case with mechanical and chemical agents, but may be observed in all the natural operations of the system. No matter how strongly we may desire to perform any voluntary

action, we cannot continue to perform it beyond a certain length of time. If, however, we allow the muscles to rest for a given time, they will be able to renew the action as vigorously as before. If the muscles of the legs be much exercised by walking, or those of the arms by manual labor, they become fatigued; their contractions take place but slowly, and are performed with evident pain; hence the necessity of sleep to recruit their exhausted energies.

The voluntary muscles are obviously designed to carry into effect such resolutions of the brain as may be necessary for the preservation and welfare of animal existence. The duties thus imposed upon them are not only conducive to the healthy performance of other functions, but are absolutely necessary to themselves. The oftener a muscle is exercised, the stronger it becomes, and increases in size, within prescribed limits. Men who exercise much, in the open air, are generally observed to be very muscular, with large and powerful limbs, and capable of enduring much fatigue. By exercising the muscles, the blood circulates more freely in the minute blood-vessels that ramify upon the external surface of the body. Digestion, respiration, secretion, and nutrition, are thus performed more perfectly; the general health of the body is increased, and the mind, itself, becomes clear and active, and more capable of governing the body.

The shortening of a muscle in order to bring any two organs nearer to each other, or to bring two portions of the same organ together, is called *contraction*; or, in other words, when the atoms which compose a muscle approach each other more closely in any one direction, on the application of a *stimulus*, the muscle is said to possess contractility. Whatever excites this muscle to contract, is called a *stimulus*. The stimulus (to the voluntary muscles) is received directly from the *brain*; the *nerves* are the agents which transmit it. The nerves are distributed in such abundance to every muscle, that the muscles of the thumb alone are supplied with more nervous influence than the largest viscera, as the liver, for

instance. The nerves enter the majority of muscles by several trunks, the branches of which are so minutely distributed and ramified throughout the cellular substance, that they soon become invisible from their minuteness.

The *involuntary* muscles, which are not under the control of the will, are hollow organs, designed to promote the growth and nourish the system of the individual to which they belong, and are mostly excited to contract by their contents. This system includes the alimentary canal, (excepting its superior and inferior extremities,) the heart, bladder, and the innumerable vessels concerned in the circulation of the blood, in nutrition, secretion, and exhalation. They are under the influence of the nerves of organic life.

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#### OF ANIMAL AND ORGANIC LIFE.

IN order that the subsequent pages may be better understood, I have introduced the following chapter from Horner's Anatomy.

“There are *two* remarkable modifications of life : *one* is common to the vegetable and to the animal, and the *other* is the exclusive attribute of the animal. Under the *first* modification are included *assimilation* (or the conversion of food into nutriment) and *excretion* (or throwing off from the system the useless matter) which, though exercised under apparently different circumstances in animals and in plants, are probably essentially the same in both. This modification is termed, by Bichat, *organic life*. By the *second* modification of life, the animal has a more extended sphere of existence than the vegetable, is put into a certain relation with all the objects that surround him, is made the inhabitant of the whole world, and not, like the vegetable, confined for ever to the place of its birth. By it the animal feels, and is conscious of external objects, reflects upon them, moves voluntarily, and can communicate, by the voice, his wants and apprehensions, his pleasures and his pains. The functions thus included, are termed, by Bichat, *animal life*.

“M. Bichat thinks the division of life into animal and organic, fully warranted by their differing much from each other in the exterior shape of their respective organs,—in their mode of action,—in the duration of their action,—in the effects of custom or habit on them,—in their relation to the moral part of man,—and in their vital force.

“One of the most prominent differences in the two lives, is the symmetry and duplicity of the organs of *animal life*, and the irregularity in shape of those belonging to *organic life*. The impression of light is received by two organs exactly alike. Hearing, smelling, touching, are likewise performed by organs having their congeners on the opposite sides of the body; and even tasting, though apparently performed by one organ, has that organ divided into two equal and symmetrical parts, thus making it like the other organs. The whole exterior surface of the body is indeed manifestly divided into two equal parts, marked off from each other by the fissure in the nose, the upper lip, the chin, the spinous processes, &c. The *brain* and *spinal marrow*, as belonging to *animal life*, consist of two halves, presenting corresponding arrangements in the developement of cavities and prominences, and so on, and in similar nerves to the organs of locomotion and of voice.

“The organs of organic life are marked, on the contrary, (with some few exceptions) by the character of striking dissimilitude in their two halves, as manifested in the liver, the spleen, the stomach, the intestines, the heart, and the great vessels belonging to it.

“Another difference between *organic* and *animal life* exists in the mode of action of their respective organs. Each of the organs of *animal life* being *double*, our sensations are the more exact, as there exists between the two impressions, from which they result, a more perfect correspondence. We see badly when the images transmitted to the brain are derived through eyes of unequal strength. Without knowing this law as theorists, we instinctively show its influence in shutting one eye while looking through a convex glass, whereby we pre-



vent a confusion of images, arising from two impressions of unequal force, concerning the same body : when one eye is weaker than the other, we squint involuntarily, and it finally becomes a habit, in order to avoid the confusion of perception from two unequal images on the brain. This accounts for squinting, both in early life, from some congenital cause, and for that squinting which is the result of inflammation in more advanced life. A little reflection on this head will satisfy us ; for, as a single judgment or perception is, for the most part, formed from the two impressions, one on each eye, how is it possible that this judgment can be accurate, when the same body is presented at the same moment with vivid or faint colors, accordingly as it was painted on the strong or weak eye ?

“ The ear is subjected to the same law as the eye. If, in the two sensations composing the act of hearing, one is received upon an organ better developed than the other, and more discriminating in its functions, it will leave an impression more clear and distinct ; but the brain being affected simultaneously by the unequal impressions, will be the seat of an imperfect conception. This case constitutes a false ear in music, and from the impressions being continually confused, prevents the individual from judging rightly between harmony and dissonance.

“ A similar reasoning has been founded by Bichat upon the structure of the nose, mouth, and organs of touch. He believes, also, that the brain, itself, as the seat of the mind, may become the cause of error in our ideas, when the two halves of it are not perfectly alike ; for example, if one of the hemispheres be more strongly organized than the other, better developed every where, and more susceptible of a vivid impression. This harmony of action also exists in the organs of locomotion, and of voice ; and any thing which interrupts their symmetry, destroys the precision with which their functions are executed.

“ Opposed to this harmony in the shape and functions of the organs of animal life, the most striking differ-

ences may take place between the organs of organic life, without much disturbance in the general result. For example, in disparities of the kidneys, of the lungs, of the salivary glands, &c. their functions are not, by any means, the less perfectly performed.

“Another very striking difference in the two lives may be observed in the duration of their action. All the excretions proceed uninterruptedly, though not uniformly. Exhalation and absorption succeed each other incessantly; assimilation and disassimilation follow the same rule. On the other hand, every organ of animal life, in the exercise of its functions, has alternations of activity and of complete repose. The senses, fatigued by long application, are, for the time, disqualified from further action; the ear is no longer sensible of sounds; the eye is closed to light; sapid bodies no longer excite the tongue; the nose is insensible to odors; and the touch becomes obtuse. Fatigued by the continued exercise of perception, of imagination, and of memory, the brain has to recruit its strength by a state of complete inactivity for some time. The muscles, relaxed by fatigue, are incapable of further action till they have been permitted to rest; hence the necessary intermission, in every individual, of locomotion and voice.

“Another striking difference between organic and animal life, is found in the epoch and mode of their origin. *Organic life* exists from the first moments of conception; but *animal life* does not commence till after birth, when exterior objects are established in a certain relation with the individual. It is more than probable that the function of the eye, the ear, the tongue, and the nose, does not exist in such a manner as to communicate their several sensations in the foetus; and that the enjoyment of a sort of indistinct sense of touch, arising from its striking against the parieties of the womb, is the only circumstance which can give the latter any idea of its existence. The *organic life*, on the contrary, of a foetus, though not so complicated as afterwards, is still remarkable for the promptitude and vigor of some of its functions, particularly of assimilation; and, in a very short

time after birth, all the organs which it employs reach their highest degree of perfection, and thus present a very different case from the organs of animal life.

“The distinction of the two lives is further kept up in their manner of ceasing in old age. Natural death, says Bichat, is remarkable in terminating *animal life* almost entirely, a long time before it does *organic life*. The functions of animal life first cease successively. The sight becomes dim, confused, and finally is extinguished. The ear receives the impressions of sound indistinctly, then faintly, and afterwards they are entirely lost upon it. The skin becomes shrivelled, hardened, loses many of its vessels, by their obliteration, and is only the seat of an obscure and indistinct touch; the hair and beard become white and fall from it. The nose loses its sensibility to odors. Of all the senses, the taste remains the longest, and exhibits the last effort of animal life.

“The powers of the mind disappear along with those of the senses. The imagination and the memory are extinguished; the latter, however, under striking circumstances. The old man forgets, in an instant, what was said to him, because his external senses, being weakened, do not confirm, sufficiently, the impressions on his mind; he is, however, able to recollect the transactions of early life, and sometimes retains a vivid impression of them. Locomotion and voice also participate in the decline of the other organs of animal life.

“If we now consider that sleep retrenches one-third of the whole duration of animal life; that nine months of it are first lost in gestation; and the extinction of our senses is the inheritance of old age; it will be seen how great is the difference between the whole duration of animal, and of organic life.”

When physiologists speak of the *organs of animal life*, they mean those which put the individual in relation with surrounding objects, viz.—the *brain, spinal marrow*, the organs of *hearing, sight, smell, taste*, and *feeling* and the voice, together with the *voluntary muscles*, or those which move the limbs. On the contrary, the or

gans of *organic life*, are those which are *not* controlled by the will, viz.—the *heart, liver, stomach, intestinal canal, arteries, veins, kidneys, &c. &c.*

The *nerves of animal life* are those which proceed from the brain and spinal marrow, and communicate the impressions which they receive directly to the brain; and which convey the different orders of the brain to the organs under its control.

The *nerves of organic life* are those not directly connected with the brain, but engaged in the several functions of nutrition, circulation, excretion, &c.

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#### OF THE NERVOUS SYSTEM.

THE study of the nervous system is of the utmost importance, and is justly considered as a fundamental part of the study of the whole animal economy. The nervous system consists of the *medullary* substance of the *brain*, (which is divided into the *cerebrum*, or brain proper, and the *cerebellum*, or little brain,) of the *medulla oblongata*, and *spinalis*; and of the same substance continued into the nerves, and thus distributed into every part of the body.

*Nerves* are long, white, fibrous cords, distributed upon the organs of sense, the viscera, muscles, and every part that is endowed with sensibility.

In the course of the nerves a number of knots occur, generally of an oblong shape and grayish-red color, called *ganglions*, which some writers have considered as so many little brains, and, consequently, the source of new nervous energy.

In their course through the body, the nerves communicate with each other, and constitute what is called a *plexus*, from which branches are distributed to every part, and the junction of the minute filamentary ends of these branches is termed an *anastomosis*.

The most important use of the nerves is to convey impressions, which are made upon their *sentient* extremities, to the brain; the perception of these impressions, by the brain, is termed *sensation*.



The nervous system is divided into two portions—the nervous system of *animal life* and the nervous system of *organic life*.

The nervous system of *animal life* consists of the *spinal marrow* or spinal nerve, which extends through nearly the whole length of the cavity of the vertebral column; of the *brain*, which entirely fills the skull; and of *thirty-nine* pair of nerves and their branches—nine pair of which proceed from the *brain*, and thirty pair from the *spinal marrow*.

The spinal marrow is placed within the vertebral cavity, and extends from the first vertebra of the neck to the first or second vertebra of the loins. In its length it does not quite fill the spinal canal, and its diameter is much smaller. It is surrounded, like the brain, with three membranes. Like the brain, also, its substance is of two kinds, *cineritious* (of the color of ashes), and *medullary* (resembling marrow); but the order of their position is reversed from what occurs in the brain. In the brain, the medullary matter is surrounded by the cineritious; in the spinal marrow, the cineritious is enveloped by the medullary. The spinal marrow is formed by six columns of nervous matter; the two anterior or front columns for voluntary motion, the two middle for respiration, and the posterior for sensation.

The use of the spinal marrow is to send out from its sides thirty pairs of nerves, which are principally distributed to the muscles of voluntary motion, and to the external skin.

The spinal marrow, as it enters a large hole at the bottom of the skull, gradually enlarges for about an inch in length, which portion is called the *medulla oblongata*. At the top of the medulla oblongata is a large projecting body, formed by processes from the *cerebrum* and *cerebellum*, called the *Pons Varolii*.

“The *brain* is a pulpy body of very irregular figure, having a number of projections and depressions, corresponding partly with the irregularities of the skull, and partly produced by convolutions and cavities in the brain itself. The brain is generally described as consisting

of four principal divisions, called *cerebrum*, *cerebellum*, *Pons Varolii*, and *medulla oblongata*.

The *cerebrum* completely fills the *upper* part of the cavity of the cranium or skull, being several times larger than the other three parts collectively. It is divided into two equal parts, called *hemispheres*, which are separated vertically by the *falx*, a membrane which dips down from the skull. This vertical separation does not extend through the whole depth of the cerebrum in its central part, but it divides it completely before and behind. (The *cerebellum*, or little brain, is situated immediately *under* the *cerebrum*, in the back part of the skull. The other portions of the brain have been described in the preceding paragraph.)

“From the lower part of the brain proceed nine pairs of nerves, most of them from the *medulla oblongata*, some from the *cerebrum*, but *none* from the *cerebellum*. These nerves are white cords, consisting mostly of medullary matter.

“The *first* pair are the *olfactory nerves*; they proceed to the organ of smelling, and are distributed to the membrane which lines the nasal cavities (or nostrils.) They are so organized, that odors, by coming in contact with this membrane, excite such conscient action in them, and the brain, as constitutes the sensation of *smelling*.

“Behind the olfactory nerves are the *optic*. These are the nerves of vision; they pass through holes in the back part of the sockets of the eyes, and through the thick strong coat of the eye-ball. Here they expand each into a semi-transparent, pulpy membrane, called *retina*. Rays of light passing through the anterior transparent coat, and through the humors of the eye-ball, fall upon the retina, and excite that conscient action in the optic nerves and brain which constitutes *seeing*.

“The *third* pair of nerves are distributed to the muscles which are attached to the eye-ball, and roll it upwards and downwards, inwards and outwards.

“The *fourth* pair of nerves are so small that they appear like sewing thread: they are exclusively appropriated to a small muscle of the eye.

“The *fifth* pair of nerves are the largest nerves that arise from the brain ; they have a very extensive distribution about the scalp, face, and mouth—going to muscles, membranes, glands, skin, &c. It is important to mention that the immediate organ of taste is a branch of the fifth pair of nerves : this branch, which is distributed to the tongue, is called the *lingual* or *gustatory* nerve.

“The *sixth* pair of nerves are small, and pass to certain muscles of the eye.

“The *seventh* pair of nerves comprises two distinct cords on each side, which have very different destinations ; and have, therefore, been considered, by several anatomists, as different nerves. One of these nerves is appropriated to the interior of the ear, and is the proper *auditory* nerve. The other is principally spent upon the face, and has been called the *facial*.

“The *eighth* pair of nerves is often called the *par vagum*, on account of its very extensive distribution. This nerve sends branches to the muscles which constitute, in part, the organs of respiration and voice ; it also sends important branches to the nervous system of organic life.

“The *ninth* pair of nerves are chiefly distributed to the muscles about the neck and mouth.”\*

To recapitulate : the first pair of nerves is distributed to the organ of *smelling* ; the second to the organs of *sight* ; a branch of the fifth to the organ of *taste* ; one of the seventh pairs to the organs of *hearing* ; and the thirty pair of nerves from the spinal marrow are largely distributed to the organ of *touch* or *feeling*.

“The sense most extended is that of the *touch*, which is enjoyed by all parts of the surface of the body ; the others are thought, by very respectable physiologists, to be only more exalted modifications of it, and are susceptible of more delicate impressions.

“The sense of *touch* is the most important of all, and the least liable to error in its reports. To exercise it, it is necessary for the body, under examination, to come

\* Knowlton.



in contact with ours : hence its operations are so mechanical, that but little is left to the imagination, and they, therefore, serve to verify and to correct the impressions on the other senses, more particularly those on the eye. It is the sense of touch by which we learn accurately the dimensions of bodies, and the figures of such as are hard. The hand, or any other part, by being applied to them in various directions, informs us whether they are flat, round, or angular. A greater or less degree of pressure informs us whether they are soft or hard, and by rubbing, we ascertain whether they are rough or polished. The resistance they make to motion, teaches us whether they can or cannot be moved. and their being impelled against us, shows the momentum with which they act, as well as its direction. Our ideas of heat and cold are also derived from this source. It is not asserted that all parts of the surface of the body enjoy equally the sense of touch ; on the contrary, this sensibility is more or less active, according to the organization of the part, and as its nerves are more or less numerous and exposed ; hence we find it most exquisite and perfect in the ends of the fingers. Man, from the nudity and the delicacy of the texture of his skin, derives, from this source, a discrimination and refinement, in regard to the nature of bodies, much superior to what many other animals possess.

“The *sight* enables us to distinguish the color, the quantity and the direction of the rays of light which proceed from a luminous body ; or, in other words, to ascertain its situation, size, and figure. In each, however, of the latter, we are exposed to great deception ; for the rays of light, by falling on a mirror, or any other plane reflecting surface, before they reach the eye, will induce us to believe the body to be in that direction. Bodies which are near reflect more rays of light than such as are distant ; we thus estimate distance by the eye ; but it happens, continually, that some bodies naturally reflect more rays than others : in consequence of which a very luminous body, at a great distance, will frequently be thought to be much nearer to us, than such



as are more within our reach. Mistakes of this kind can only be corrected by the sense of *touch*, and our habitual reference to it, and continual experience, finally enable us to form prompt and just decisions. The eye, however, infinitely exceeds the touch in the rapidity with which it communicates ideas, and also in the extensiveness of its application in a single moment. It is, therefore, an organ of the first utility in making us acquainted with surrounding objects. Man does not possess it to that comparative perfection that some other animals do; he can neither see so far as the vulture or eagle, nor so minutely as the fly; yet his ingenuity has enabled him to excel both. For, with the telescope, he examines worlds in the immensity of space, which, under common examination, are either invisible, or form mere points in the heavens. And, with the microscope, he sees the texture of the most minute atom.

“The *ear*, along with the powers of articulation, enables the whole human family to make a common stock of the knowledge which each individual may possess. As connected with the preservation of the individual, it is much less important than the eye or the touch; yet, by cultivation and by studying its most minute and delicate impressions, an endless source of instruction and amusement has been opened to us, in the intonations of language, and in the enrapturing strains of harmony. It eminently qualifies man for the social state, occasionally warns him of danger, and allures him to such things as are useful to his subsistence.

“In regard to the *taste* and *smell*, they make us acquainted only with such objects as are necessary to our subsistence. They are enjoyed too imperfectly by man, for them to become a fruitful source of his intelligence. As they principally lead us to filling the stomach, and to debasing the intellectual man into the beast, that eats and dies; the wisdom of nature is as fully demonstrated in the imperfection which she has put upon these senses and our inability to improve them, as in the exalted and varied degrees to which she has carried the others. The keenness of the scent of the hound, and the discrimi-

nating nicety of the bee, by opening sources of enjoyment merely physical, would have degraded instead of elevating us, by engrossing our time and ingenuity in the developement of pleasures incompatible with our constitutions and destinies.”\*

“The nervous system of *organic life* consists of two chains of *ganglions* situated within the body, one on each side of the spinal column; and of the infinite number of small nerves which proceed from these ganglions.

“The ganglions are little reddish or grayish bodies, of a texture which has nothing in common with that of the cerebral substance, being rather spongy than pulpy. These bodies, as well as the nerves which issue from them, possess but a very low degree of sensibility. Bichat has shown that they may be powerfully irritated in a living animal without the animal exhibiting signs of suffering; but if you irritate a nerve from the brain or spinal cord, the animal instantly cries out and struggles. I think it more than probable that what little degree of sensibility the organic system possesses, is owing to the many twigs which it receives from the animal system.

“Hence the lungs, heart, stomach, liver, spleen, bowels, in short, all those organs which receive the principal part of their nerves from the *organic* system, possess but a low degree of sensibility, especially in a healthy state. We do not feel the blood pour into the heart; we do not feel the contents of the bowels moving downwards; we do not feel any of the healthy actions of those organs contained in the two great cavities of the body—the *thorax*, and the *abdomen*.

“The ganglions, strung along on each side of the spine, from the upper part of the neck to the lower part of the pelvis, are united with each other *directly* by a nervous cord that proceeds straight along from one ganglion to another. Each ganglion gives off several nerves, and these nerves, proceeding from the ganglions on each side of the spine, form several important plexuses; and from these plexuses proceed nerves to the thoracic and abdominal *viscera*. And although several

\* Dr. Horner.

of the *viscera*, as the heart, stomach, and bowels; are muscular organs, they cannot be excited into action, or stopped, by any thinking going on in the head; or, to use the more convenient, but less correct language of the schools, these muscular organs are not under the control of the *will*: hence they are called *involuntary muscles*.\*

“In their healthy state, the nerves of organic life have no sensibility: and hence they are also called the nerves of vegetative life; because the functions of the organs depending on them for nervous energy, are, in their healthy state, performed without the consciousness of the animal. But these nerves are capable of being irritated into a state of excessive irritability and diseased sensibility, which is utterly incompatible with their healthy and peculiar susceptibility; and, consequently, incompatible with the healthy performance of the functions of those organs which depend on them for nervous energy.

“Unhappily for man, almost every circumstance and influence in civic life, tend to the developement of preternatural irritability and diseased sensibility in their nerves. All undue excitements and exercises of the mind, and of the passions; all excessive indulgences of the appetites; improper qualities and quantities of food; the debilitating habits of indolence and effeminacy; the various customs and circumstances of artificial life, such as appertain to habitation, clothing, locomotion, the preparation of food, &c. &c.—all act upon the stomach to disturb its functions, and to impair the health of its nervous and muscular tissues.”†

#### OF THE ADIPOSE OR FATTY TISSUE.

THE *Adeps* or *Fat* is an oily secretion from the blood into the cells of the cellular membrane, and is generally estimated at about one-twentieth of the entire weight of the body. It is found beneath the skin; in the interstices of muscles; in the bones, and surrounding most

\* Knowlton.

† Graham.

of the internal organs. In chemical composition, fat differs from all other parts of the body by the absence of nitrogen. Its uses are not well understood. By lubricating the solid parts of the system, it may serve to facilitate their movements; to diminish pressure, in exposed parts, as the hands and feet; to prevent an undue sensibility of the skin, by protecting the nerves; by distending the skin, it rounds the outlines of the body, and conceals those bony and muscular projections, which render very lean persons so destitute of beauty; by being a bad conductor of caloric it may serve to retain animal heat.

A moderate quantity of fat is not only natural but necessary to the perfection of the system; an undue accumulation, on the contrary, is unnatural and injurious to the healthy performance of the various functions. The active and laborious, although very muscular, seldom experience any inconvenience from excessive fat. The indolent, good-natured, well-fed epicure, if free from anxiety and care, will frequently acquire an enormous amount of fat, especially if his other habits be accompanied by that of sleeping much during the day.

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#### NUTRITION.

THE food which we eat, after being received into the stomach, is converted, firstly, into a pulpy mass, of the consistence of paste, secondly into a milky fluid, and subsequently into *blood*; the blood, during its circulation through the system, loses, successively, various portions of its substance, which are deposited, by the proper vessels, into the several tissues of the body, becoming constituent particles of muscles, bones, arteries, nerves, &c. After remaining a certain time in the system, these particles *wear out*, or become useless, and another set of vessels remove them into the blood, from which they are at length expelled, in a liquid form, by the proper organs, either by the skin, as perspiration; by the kidneys and bladder, as urine; or by the lungs, as vapor. Constantly losing, by these processes, con-



siderable portions of the body, it is necessary that the stomach should be regularly supplied with both liquid and solid food to repair the waste, and the necessity for this new supply is made known to the individual by those peculiar sensations called hunger and thirst.

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OF THE ORGANS OF DIGESTION.

DIGESTION is the process of converting alimentary substances into arterial blood: all animals are furnished with organs of digestion, which act upon the food presented to them, change its qualities, and convert it into a new substance adapted to their nourishment and growth.

The organs of digestion consist in an uninterrupted canal, extending from the lips to the inferior extremity of the intestines; and of numerous glandular bodies, placed all along its track, for pouring their secretions into it. This canal is called the *alimentary canal*, and is divided into six parts,—the *mouth*, the *pharynx*, the *oesophagus*, the *stomach*, the *small intestine*, and the *large intestine*. The alimentary canal is lined, from one extremity to the other, with a very delicate skin, called the *mucous membrane*, because it secretes a fluid which has received the name of *mucus*. The mucous membrane is a continuation of the skin of the face, from which it may be distinguished by its redness, as on the lips, and in the mouth. Its surface is constantly moistened by the *mucous fluid* to protect it from the air and the food which come in contact with it; and also to facilitate the passage of the aliment and excrementitious matter.

The glandular organs are the *salivary glands*, the *pancreas*, the *liver*, the *spleen*, and a number of *muciparous glands*. *Glands* are organs destined to *secrete* or alter some particular fluid, as, for example, the *salivary glands* secrete the *saliva* or spittle, and the *liver* secretes *bile*.

The functions of digestion are arranged as follows:

1. The prehension or seizing of food.
2. Mastication (or chewing.)
3. Insalivation (or mixing the food with the saliva.)
4. Deglutition (or swallowing.)

5. The compound action of the stomach
6. The action of the duodenum.
7. The action of the small intestine.
8. The action of the great intestine.
9. The expulsion of the fæcal matter.
10. Animalization.

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PREHENSION OF ALIMENTS.

As man does not suck up his nourishment like plants, by means of roots, he is furnished with organs of locomotion which enable him to move from one place to another and select such food as may be, with propriety, introduced into the stomach. In a perfectly natural condition his senses would be the judges of the wholesome or injurious nature of aliments. The sight would direct him to the food; the hands would seize and apply it, first to the nose, and then to the mouth; if the odor was grateful to the nostrils, and the taste agreeable, it would be instinctively eaten. From successive abuses, however, the organs of sense have become so habituated to various kinds of food, originally disagreeable, that they are incompetent to decide upon its fitness. Even now we are warned from poisonous plants by the odor and the color, without resorting to the taste; and if we accidentally meet with an article of food to which we have not been accustomed, provided it has not been subjected to the action of heat, the organs of sight, smell, and taste will enable us to judge pretty accurately whether the article is wholesome or not.

The hands are the chief instruments of prehension; and a consideration of their mechanism, by comparing it with that of other animals, would afford sufficient data to decide the long-agitated question, whether man is organized to live upon flesh or upon fruits.

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MASTICATION

THE food, after having been seized by the hands, is introduced into the mouth. Its mechanical division by

the teeth is called *mastication*, or chewing. The food, divided by the front teeth, is moved about from side to side, by the lips, the tongue, and the motion of the lower jaw, and is divided into still smaller portions by the back teeth; during this division it is intimately mixed with a vital solvent called the *saliva* or spittle, and being pressed successively between the surface of the tongue and the roof of the mouth, its contact produces the impression on the gustatory nerves which constitutes the sense of taste, the intensity of which is proportioned to the minuteness of division which the food has undergone. During mastication the mouth is shut behind by the curtain of the palate.

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#### INSALIVATION.

INSALIVATION is the process by which food is mixed with the *saliva*. This is a highly important function, and on its faithful performance depends the proper digestion of aliments received into the stomach. All solid food taken into the mouth should be deliberately chewed, and never swallowed, until, by mixture with the *saliva*, it had become sufficiently moist to descend into the stomach without requiring drink to wash it down.

The mucous membrane which lines the mouth, gives origin to numerous small glands, which are continually pouring the fluid they form into the mouth; it is this *mucous fluid* which gives to the spittle its frothy appearance. Fluids are also pouring into the mouth from the *salivary glands*, which are six in number, three on each side of the neck; two of them under the ear, are called *parotid glands*; two under the lower jaw, the *submaxillary glands*; and two under the tongue, the *sublingual glands*. When pressed upon during mastication, the *saliva* is forced out, and becomes intimately blended with the food; hunger, and the sight of aliment, will often provoke a copious emission of this fluid.

The *saliva* is a transparent viscous fluid, of considerable service in digestion; it is composed principally of water, albumen, mucilage, and the various salts which

they hold in solution. Its uses are important: it increases the taste of the food; by mixing with the aliment, it changes it into a soft and pulpy mass, which is the first process of chymification; it absorbs oxygen from the air, which combines with the food; it allays thirst by moistening the mouth and fauces.

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#### DEGLUTITION.

**DEGLUTITION** is the action of swallowing. Simple as it may seem, this is a very complicated process. The food, after having been minutely divided, is collected together on the surface of the tongue, and pushed backwards toward the palate, which it raises; the *larynx* (upper part of the wind-pipe) rises at this instant, and its opening is covered by a valve called the *epiglottis*—this valve always covers the larynx to prevent the food from entering the wind-pipe. The surrounding muscles and the tongue press the food over this cavity, and it drops into the *pharynx* (upper portion of the *œsophagus*;) the larynx descends, the epiglottis rises, and the wind-pipe opens to receive the air; the pharynx contracts and forces the aliment into the *œsophagus*. The *œsophagus* is that portion of the alimentary canal commonly called the meat-pipe or gullet. By the muscular contraction of the *œsophagus*, the food is carried along its cavity until it reaches the stomach; the moment it enters this organ, the termination of the *œsophagus* contracts to prevent the food from returning. Along the whole of this tube the mucous follicles are very abundant, and pour out their fluids as they are pressed by the food, which is thus enabled to slide easily into the stomach.

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#### DIGESTION IN THE STOMACH

**AFTER** that portion of the alimentary canal called the *œsophagus* passes out of the *thorax* (or chest) into the *abdomen* (or belly) the alimentary canal becomes considerably enlarged, forming a sac or bag, capable of



holding from two to six pints, and is familiarly known as the *stomach*. The stomach has two openings; that which leads to the œsophagus is called the *cardiac orifice*, and that which communicates with the intestine is called the *pyloric orifice*. Each of these orifices is surrounded with muscular fibres, whose contractile powers prevent the food from returning into the œsophagus, and retain it in the stomach until it has undergone the necessary change.

The stomach is composed of several membranous coats. Its outer coat is the *peritonæal*; the inner coat is called the *mucous* or *villous* coat—it has received the latter name from its resemblance to velvet. Between these two coats is the *muscular*. The stomach is very largely supplied with nerves and blood-vessels; and its *villous* coat, which is a continuation of the mucous or lining membrane of the mouth, is studded with the orifices of numerous glands, which pour into the stomach not only the lubricating mucus, but a peculiar fluid, which is supposed to be the chief agent in chymification, called the *gastric juice*. Innumerable experiments have been tried with a view of determining whether digestion is the result of *fermentation* or *mechanical trituration*, or whether it is owing to the solvent properties of the *gastric juice*. The majority of physiologists incline to the latter opinion, although some recent experiments have been made which justify the conclusion that digestion is the result of nervous influence. How far this opinion is correct it is impossible to decide, and the theory of the gastric juice, being the one which has received the most general sanction, will be adopted in the present section.

The moment the stomach is stimulated by the presence of food, its *cardiac* and *pyloric* orifices contract, and fluids, of various kinds, flow rapidly into it. The aliment remains in this situation, without apparent change, for about an hour, exposed, during that time, to the combined action of the *gastric juice*, *muscular power*, *nervous influence*, and increased temperature of the stomach. The gastric juice dissolves the food and com-

pletely changes its nature. That portion of the food, lying nearest to the pyloric orifice, gradually loses its original properties, and becomes converted into a soft, pulpy, homogeneous substance, of a greyish color, and slightly acid taste, called *chyme*. If the chyme is properly prepared, the pyloric ring relaxes, and the muscular coat of the stomach propels the food into the *duodenum* (or second stomach;) but if any portion of food, not well digested, presents itself at the pyloric orifice for a passage into the duodenum, the muscular fibres of the *pylorus* violently contract, and the food is carried back to undergo a more complete digestion. If it be again presented at the pylorus, in an improper condition, it is again worked back, and is only permitted to pass the orifice, either when it is perfectly converted into *chyme*, or successive attempts to pass have rendered the pyloric orifice insensible to its stimulus.

The function of the stomach is to convert food into *chyme*. That it may be enabled to perform this more perfectly, it is necessary that the aliment should be minutely divided, mixed with the saliva, and reduced to the consistence of paste; large pieces of food, swallowed without chewing, remain a long time in the stomach, causing considerable uneasiness, and frequently generating large quantities of gas. The solid food should be of a certain consistence, that the individual may be obliged to chew it before swallowing.

Although solid food is converted into *chyme*, liquids, such as water and ardent spirits, pass out of the stomach without experiencing any alteration, and are soon mixed with the blood. Milk coagulates (or becomes solid) and separates into two portions, previous to digestion. Soup, and other liquids, holding in solution nutritious matter, are difficult of digestion; they dilute the gastric juice and weaken its power: they are not digested until the water which they contain is absorbed, that is to say, until it passes out of the stomach; and the solid portions of such preparations are converted into chyme. Oil, melted butter, and liquid fat, obstinately resist the action of the gastric juice, which latter, being of the

nature of water, cannot readily penetrate nor combine with their substance.

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OF DIGESTION IN THE DUODENUM.

THE small intestine is divided into three portions—the *duodenum*, the *jejunum*, and the *ileum*. That portion of the intestinal tube, which commences at the pyloric orifice of the stomach, and extends for about the breadth of twelve fingers, is called the *duodenum*. It is in this portion of the alimentary canal that the *chyme* is converted into *chyle*. Its diameter is much greater than that of the *jejunum* and *ileum*. A duct from the *liver* called the *hepatic* duct, and another from the *gall-bladder* called the *cystic* duct, unite and form a common duct, or tube, which, with the *pancreatic* duct, enter the *duodenum* by one common orifice.

The *hepatic* duct of the *liver*, and the *cystic* of the *gall-bladder*, convey, into the *duodenum*, a viscous, bitter, and yellowish fluid, called *bile*: and the *pancreatic* duct conveys a fluid resembling the *saliva*.

The *liver* is the largest glandular body in the human frame, containing a great number of blood-vessels, particularly *veins*. The use of the *liver* is to secrete *bile*, a fluid of the utmost importance in chyfication. The *gall-bladder* is a reservoir for the *bile*.

The *pancreas* is the largest of the salivary glands; it is that portion commonly called the sweet-bread. It is a long, tapering, glandular body, of a dull white color, tinged with red. Its use is to secrete the *pancreatic* fluid, which is analogous to the *saliva*.

The food in the stomach is changed into *chyme*. The *chyme*, on quitting the stomach, enters the *duodenum*, where a considerable portion of it is converted into a fluid resembling milk, called *chyle*; those portions of the *chyme* which are not converted into *chyle*, are of no use to the body, and are called *excrementitious matter*.

Shortly after the *chyme* enters the *duodenum*, the *pancreatic fluid* and the *bile* are poured into the same organ; they penetrate the *chyme*, render it fluid, and se-

parate the nutritious portion (or *chyle*) from the excrementitious matter. The albuminous and saline particles of the bile combine with the *chyle*, and are carried with it into the blood; but the oily, colored, bitter parts of the bile, envelope the excrements, and impart to them stimulating qualities, with which they are thrown out of the body as useless. The function of the duodenum is to convert the *chyme* into *chyle*. It is known that this is effected by the pancreatic and biliary fluids; but in what manner they operate to separate the *chyle* from the excrement, it is absolutely impossible to determine in the present imperfect state of knowledge.

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#### OF THE ACTION OF THE SMALL INTESTINE.

THE *duodenum* is the commencement of the small intestine—the remaining portions are the *jejunum* and the *ileum*; but these divisions are arbitrary. On the inner surface of the jejunum and ileum may be observed a multitude of minute orifices; these are the mouths of numberless small vessels called *lacteals*, whose function it is to absorb the chyle and convey it into the blood.

After the alimentary mass has passed from the duodenum into the jejunum, (which is effected by the *peristaltic* or worm-like motion of the intestinal canal,) its fluid or chylous portions are taken up or absorbed by the inhaling mouths of the *lacteals*. But the chyle is not all absorbed by the lacteals of the jejunum; the alimentary mass, carried, by the peristaltic motion of the canal, into the ileum, loses, successively, those portions of *chyle* not previously absorbed, until it reaches the commencement of the large intestine, where nearly all that remains is excrementitious.

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#### OF THE GREAT INTESTINE.

THE great intestine, though much shorter than the small, is larger in diameter: it is divided into three portions—the *cæcum*, the *colon*, and the *rectum*. It may be considered as a kind of reservoir for containing the ex-



crementitious matter during a certain time, to prevent the individual from the constant necessity of parting with it. The alimentary mass, after leaving the small intestine, enters the *cæcum*, losing what little portions of chyle may have remained, and is then propelled into the *colon*, in the cells of which the excrementitious matter is thickened, hardened, and moulded; and, by the peristaltic action, it is pushed into the *rectum*, which is the termination of the alimentary canal, in the cavity of which it accumulates, until the distension it produces announces the necessity of relief.

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#### OF ANIMALIZATION.

THE *lacteals* and *lymphatic* vessels, after leaving the intestinal canal, unite and form, at the upper part of the *abdomen* or belly, the *thoracic duct*. The *lymphatic* vessels convey the *lymph*, which is the old worn-out matter of the system; and the *lacteals* convey the *chyle*, which is the nutritive matter, to supply the place of the lymph, into the thoracic duct. The thoracic duct ascends along the right side of the spine, passes behind the gullet and wind-pipe, and enters the left subclavian vein; its contents soon reaching the heart, mixed with the blood.

The blood, changed by mixing with the chyle and the lymph, enters the heart: it is then propelled into the lungs, through the *pulmonary artery*. This blood, which is of a dark red color, circulates in the numerous air-cells of the lungs, is there exposed to the action of the air which we inhale, and is changed from a dark red to a bright scarlet color. It then returns to the heart through the four *pulmonary veins*. The heart contracts, forces the blood into a large artery, called the *aorta*; which artery, as it leaves the heart, becomes smaller and smaller, sending off branches to every part of the system, and these branches, constantly diminishing in size, send off still smaller branches, which at length, from their minuteness, are called *capillary vessels*. These vessels deposite, in the several tissues of the body, particles of blood, which become bone, muscle, or nerve,

as they are deposited in either of those organs. The blood, passing out of the arterial capillaries, enters the veins. The veins commence where the arteries terminate, and increase in size, until they are all collected into two large trunks, the ascending and descending *vena cava*, which both empty the blood they contain into the heart, and which blood is again propelled into the lungs to be purified by the contact of atmospheric air.

The blood which circulates through the body is of two kinds: that which circulates in the *arteries* is of a bright scarlet color, and is called *arterial* blood; that which circulates in the *veins* is of a dark red color, and is called *veinous* blood. That which circulates in the arteries is applied to nourish the body, but that which circulates in the veins is unfit for that purpose.

The *heart* is a hollow muscular organ, enclosed in a membrane called the *pericardium*, and is situated between the lobes of the lungs, in the *thorax* or chest. It is divided into four cavities or apartments—two of which are called *auricles* and two *ventricles*. The dark red blood of the *veins* enters the *right* auricle of the heart, from which it flows into the *right* ventricle; the *right* ventricle contracts, and forces the blood into the *lungs* through the pulmonary *artery* (incorrectly so called.)

The dark red blood of the veins undergoes important changes in the lungs. The *lungs* are two large spongy bodies, one on each side of the heart, above which they are united. They are composed of a multitude of minute air-cells, which are formed of very thin membranes that communicate with each other in such a manner that the air we breathe may find its way into every one of them. The *trachea* or wind-pipe, when it enters the chest, divides into two branches, one going to each lung, which branches are again subdivided, opening into the air-cells. The dark red blood, having entered the lungs, through the pulmonary artery, comes in contact with the air which we breathe, and which has descended through the wind-pipe, and found its way into the air-cells of the lungs. Atmospheric air is composed of 20 parts of *oxygen*, 79 of *nitrogen*, 1 of *carbonic acid*, and

some aqueous vapor. A portion of the *oxygen* unites with the *carbon* of the dark red blood; the blood, deprived of its carbon, assumes a bright scarlet color: it receives from the *oxygen* a portion of caloric, so that its heat is one degree higher than that of the dark red or venous blood; it parts with a portion of its serum or watery part; its odor becomes more sensible, and its taste more distinct. The air, when expired, or breathed out, is found to have suffered a considerable change. It has lost two parts of its *oxygen*, and, instead of one part of carbonic acid that was inhaled or breathed in, three parts are breathed out. The two parts of *oxygen*, having united with a definite proportion of the *carbon* of the veins, are thrown out in the form of *carbonic acid*. So necessary is it that the dark red blood should be deprived of its carbon, that the suspension of breathing for a few moments will destroy life. A large quantity of aqueous vapor, called *pulmonary transpiration*, is thrown off from the lungs with the expired air. The dark red blood, deprived of its carbon, and converted into the bright scarlet of the arteries, passes through the four pulmonary veins into the *left* auricle of the heart; from the *left* auricle it flows into the *left* ventricle, from which it is propelled into a large artery called the *aorta*. This artery, divided and subdivided until its minute ramifications are almost invisible to the naked eye, distributes the blood to every portion of the body. The arterial blood, when it enters a muscle, loses those portions which are analogous in composition to the muscle; and, as it circulates through the bones, and various other organs, similar phenomena occur. The arterial blood then flows into the veins; the venous blood, loaded with impurities, receives the *chyle* or nutritive matter, and the *lymph* or worn-out matter, the whole of which empties into the heart, and is then propelled into the lungs for purification.

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#### OF DEPURATION.

CERTAIN particles of matter, after having remained a certain time in the system, become worn-out, that is to



say, they are no longer fitted to fulfil the duties originally imposed upon them, when they became constituent portions of the living body. Appropriate organs are appointed to remove them from the body, while other organs supply their places with new particles derived from the food, after it has undergone digestion. The organs, which are appointed to remove these worn-out and useless particles, whose further stay in the body would be injurious, are three in number, viz. the *skin*, the *lungs*, and the *kidneys*.

The *skin* is composed of three layers, the *cuticle*, the *rete mucosum*, and the *dermis* or true skin. The *cuticle* is an insensible, horny covering, which may be cut or torn without causing pain or bleeding, because it possesses neither nerves nor blood-vessels. It is that portion of the skin which peels off when the hands have been blistered. It covers the whole body, being thicker in some places than in others, particularly in the palms of the hands and on the soles of the feet. Wherever a part is pressed upon, the cuticle thickens, to defend the soft parts below it from the effects of pressure; the cuticle covering the hands of the mechanic or laborer will be found thicker and much harder than that of the merchant or clerk. *Corns* on the feet merely result from a thickening of the cuticle to preserve the parts below from the effects of the pressure of the shoe. The cuticle serves to blunt the exquisite sensibility of the true skin, to keep it moist, and to protect it from injury. It is also called the *epidermis*. Between the cuticle and dermis or true skin, is the *rete mucosum*, a mucous substance, deposited in a net-like form, which connects the cuticle with the dermis, and serves to protect the nerves and vessels of the latter. In the European the *rete mucosum* is white or brown, and, in the Negro, it is black. Immediately below the *rete mucosum* is the *dermis*, or true skin, composed, almost wholly, of nerves and blood-vessels. So abundant are these, that you cannot puncture the skin with the point of the finest needle without causing pain or drawing blood. It is this skin which is the seat of *touch*, but its most important use is to elimi-



nate, through its multitudinous pores, the worn-out and useless matter of the system. When the body is cool, and resting from exercise, this worn-out matter passes off in the form of *insensible perspiration*, at all times, averaging a pound during 24 hours. But, when the body is heated or excited by exercise, this perspiration may be observed on the skin in large drops, and is then called *sweat*. When this perspiration is checked, it frequently gives rise to coughs, colds, and consumption. The skin sympathizes with the lungs and kidneys; that is, when a smaller quantity of perspiration than usual, passes off through the skin, the matter discharged by the lungs and kidneys is proportionably increased: thus, in winter, the perspiration is diminished and the kidneys secrete a larger quantity of urine. In summer it is directly the reverse. It will be shown hereafter how important it is that perspiration should continue uniformly and uninterruptedly.

The *perspiration* from the *lungs* has been already described.

The *kidneys* are two organs situated on either side of the spine, in the abdominal cavity, and shaped like a kidney bean; they secrete the *urine*. A long membranous canal, called the *ureter*, conveys the urine from the kidney to the bladder. The urine is an excrementitious fluid, removing from the body the superfluous water, saline substances, animal and earthy particles, and other noxious substances for which nature has not provided an outlet.

## DIET AND REGIMEN.

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### REMARKS.

**MAN**, with every advantage of knowledge, facility of intercourse, and adaptation to circumstances, is the most wretched creature that ever saw the light. Continually seeking happiness, he is unhappy; inventing new modes of pleasure, he is miserable; desirous of preserving health, he is diseased; a lover of virtue, he is vicious; an advocate of mercy, he is cruel; a friend of liberty, he is tyrannical; an admirer of truth, he is false and deceitful: in short, he who fancies himself elevated above the brutes of the field and the fowls of the air, is only superior in point of intellect; his morals are evidently inferior, and, when drunkenness and debauchery subvert his reason, where is his superiority. Other animals kill only to sustain their own existence; but they neither destroy their own species nor injure each other, except in self-defence. Man, who prides himself upon benevolence and reason, exterminates millions of his race, and rejoices at his victories; he destroys the lower order of animals to gratify his palate, and torments those whom he has no occasion to injure, while many he even kills for amusement. Peevish, fretful, and discontented, he is angry with his companions for *thinking* otherwise than himself, and will even persecute and murder his brethren for opinion's sake.

If we seek for the cause of misery and crime, we may trace it in man's unnatural habits; thence originate the malignant passions which disgrace the human character; wars, murders, tyranny, and revenge are the result; and that overweening selfishness which induces one individual to promote his own comfort at the expense of another's enjoyment, springs from the same source. Man is so organized that he derives pleasure from every action destined to preserve his own existence or that of the race. Naturally, the mind is exquisitely sensible to agreeable impressions. The introduction

of food into the stomach is attended with the most delightful sensations ; yet we do not eat for that purpose alone, but also to preserve life. Sleep is delicious ; but pleasure is not the object of sleep—it is a wise provision to restore expended energies. The intercourse of the sexes is a source of intense gratification ; the object, however, is the reproduction of the race. Had Nature neglected to render these actions agreeable, the human family would long since have been extinguished. Every action that naturally contributes to our pleasure is beneficial ; the odor of flowers, their brilliant hues, and admirable forms ; the mastication of delicious food ; the pleasure of gentle exercise ; and, lastly, sleep ; all contribute to the health and preservation of the individual. But, when the laws of relation are violated, when the nostrils are offended by the vapors of putrefaction ; when disagreeable and stimulating substances are introduced into the stomach ; when the body is long inactive ; and when the sleep is disturbed, or indulged in at improper periods ; disease and premature death is the unavoidable consequence. Every violation of Nature's laws is attended with a penalty proportioned to the extent and duration of such transgression. If we would be perfectly happy, and enjoy all the pleasure that human beings are capacitated to enjoy, we should live in exact conformity with those laws instituted for our government ; because man is not more independent of them than other animals, while their observance is inseparably connected with his welfare.

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AIR.

THE invisible, colorless, elastic fluid that we breathe, is called *air*. Its importance to health and life is so great, that, although men may subsist for several days without partaking of food and drink, yet the suspension of breathing for a few minutes will infallibly destroy life. At the moment an infant is born, the atmospheric air rushes into its lungs, to fill the vacuum caused by the expansion of its chest ; and from that moment, sleeping

or waking, until the period of dissolution arrives, the atmosphere constantly finds its way into the lungs, and is as constantly expelled.

Atmospheric air is chemically composed of 20 parts of oxygen, 79 of nitrogen, and 1 of carbonic acid, holding in solution a large quantity of watery vapor. It is the oxygen gas, alone, which is essential to the existence of animals; the nitrogen, although constituting more than three-fourths of the atmosphere, merely dilutes the oxygen and diminishes its stimulating properties, in the same way that water, added to ardent spirits, weakens its stimulating power. The oxygen, when *inspired*, unites with the *carbon* of the blood, which is *expired* or thrown out in the form of *carbonic acid*. A human being requires a *gallon* of fresh air every minute, dying equally if deprived of air, or if confined to the same. The oxygen of the atmosphere not only purifies the blood, but furnishes the body with its *heat*; so that in the coldest weather the living body maintains a temperature scarcely inferior to that which it possesses in summer. No substance will burn in an atmosphere deprived of oxygen. A piece of wood, if lighted, is consumed by the union of oxygen; that is, the oxygen unites with the wood, giving out its *latent* caloric, or heat. Candles, burning in an apartment, deprive the air of oxygen: hence the necessity, in a room where a fire is burning, or lights, that it should be frequently ventilated, and the air renewed.

To render the air fit for respiration, it is necessary that every 100 gallons should contain 20 of oxygen, although this amount may be diminished to 7 or 8 without causing death; but in such cases the breathing is laborious, panting, and attended with a sense of suffocation; in short, asphyxia ensues, even while the air still contains a certain quantity of oxygen, of which the lungs cannot entirely deprive it. If a number of persons be collected together in a confined apartment, where the air cannot be easily renewed, the quantity of oxygen diminishes rapidly, while that of carbonic acid as rapidly increases. The carbonic acid, being heavier than



air, sinks to the lowest part of the atmosphere, producing death wherever it is breathed by a living animal. Hence a bed should never be placed on the ground, in a small room; hence the *pit* is the most unhealthy part of a play-house.

In crowded assemblies, theatres, or churches, those who are congregated together, not only injure each other by depriving the atmosphere of its oxygen, but they alter its composition by the combination of those substances exhaled from their bodies. The carbonic acid from the lungs, the perspiration, and other animal emanations, become putrid while in the atmosphere, and are the source of the most fatal diseases. We inhale the atmosphere to purify the blood and carry off those particles which are poisonous to the system, and yet, in crowded places, we are continually breathing an atmosphere, corrupted by the emanations from ulcerated lungs, decayed teeth, and perspirable matter: can we wonder, then, that it has been said, that large towns are the graves of the human species?

Examples of the fatal effects produced by breathing impure air, are every where abundant. The jail and hospital fevers are owing to this cause. In the lying-in-hospital at Dublin, 2944 infants, out of 7650, died in the year 1782, within the first two weeks after their birth, that is, nearly every third child. Almost all of them died in convulsions, foaming at the mouth, with their jaws closed, and their thumbs drawn into the palms of their hands. The attending physician, observing that their faces were swelled and looked blue, as if they had been strangled, concluded that the rooms were too confined, and that the infants had not a sufficient quantity of pure air to breathe. The rooms were enlarged and ventilated; the consequence was, that not one child died where they had formerly lost three.

The most melancholy case is that of the 146 Englishmen, who were locked up all night in the Black Hole, a dungeon in Fort William, at Calcutta; the dungeon was only eighteen feet square, partially under ground, with only one small window to admit the air and light: they

entered at eight o'clock in the evening; very soon a profuse perspiration commenced, followed by a high fever and raging delirium, with cries of *air, air, water, water*. At six o'clock in the morning, only 23 had any vestiges of life, 123 having died under the most horrid of all tortures, that of slowly increasing suffocation.

Even when not totally deprived of its oxygen, the atmosphere is rendered unfit for respiration on account of the large amount of *carbonic acid* exhaled from the lungs and skin, which is a poison to all who breathe it. Carbonic acid is generally known as *fixed air*, or *choke damp*. It is frequently found at the bottom of old wells, where it may be known by its extinguishing a candle or other ignited substance. It is totally unfitted for combustion, extinguishing flame almost immediately. The burning pungency of champagne, beer, and porter, is owing to the carbonic acid which they contain. Soda water owes its peculiar biting taste to carbonic acid. The fumes of burning charcoal are well known to be injurious to the lungs, and numerous instances have occurred in which they have caused immediate death by suffocation. The *oxygen* of the atmosphere, combining with the ignited charcoal, which is mostly composed of *carbon*, forms *carbonic acid*, in the same way that it is formed when the oxygen combines with the carbon of the blood. If charcoal be burned at all, great care should be taken to ventilate the apartment, either by admitting air from without, or providing some vent, as a chimney or pipe, to carry off the fumes.

Every individual, who values health, should spend at least two hours in the open air each day, and longer if possible. In our variable climate, where we sometimes have the four seasons in one day, it is absolutely necessary that the body should be exposed to the influence of external air, to diminish that morbid sensibility to the changes of weather, so prevalent among the inactive inhabitants of our large cities, and which is so often a prolific source of the most dangerous diseases. It is well known that those who spend much time in the open air are but little affected by the changes of weather.

while those who are much confined to their apartments, sensibly feel all the variations of heat and cold, humidity and dryness, and the least exposure to wet or damp may bring on a severe attack of inflammation of the lungs, or consumption. Children, who are early inured to the external air, if they are accustomed to an extreme simplicity of diet, experience no more inconvenience from changeable weather than domestic cattle. Parents, however, from mistaken fondness, are fearful to expose their children to the influence of the atmosphere, as if they considered them so many pieces of polished steel, which would rust by such exposure.

To all who can make it convenient, I would strongly recommend the advice of DR. ARMSTRONG—

“Ye who amid this feverish world would wear  
A body free of pain, of cares a mind;  
Fly the rank city, shun its turbid air,  
Breathe not the chaos of eternal smoke,  
And volatile corruption, from the dead,  
The dying, sick’ning, and the living world  
Exhal’d, to sully heaven’s transparent dome  
With dim mortality. IT IS NOT AIR,  
That, from a thousand lungs, reeks back to thine,  
Sated with exhalations rank and fell,  
The spoil of dunghills, and the putrid thaw  
Of nature. \* \* \* \* \*  
While yet you breathe, away! the rural wilds  
Invite, the mountains call you, and the vales;  
The woods, the streams, and each ambrosial breeze  
That fans the ever undulating sky.”

A little reflection upon one of the most singular phenomena in the economy of nature, will explain the principal reason why the country air is more salubrious than the city. Vegetables give off, during the day, the pure oxygen so necessary to the existence of animals. Animals breathe in and feed on this oxygen which plants disengage, at the same time throwing off carbonic acid from their lungs. During the night, vegetables absorb and feed on this carbonic acid, which was thrown off from the lungs of animals. Thus, by a beautiful reciprocity of action, plants feed on the noxious gas which would otherwise be destructive to animal life, and animals consume the vital air which is generated in its stead. All who have sallied forth at sun-rise in the country, can recall to mind the delightful sensations



they experienced while inhaling the morning air, rich with the odors of a thousand plants, invigorating the body, and soothing the mind. At no other period of the day does the air smell so sweet, nor do we derive half the pleasure from breathing it at any other time that we do in the morning. It is the oxygen that plants are elaborating, which renders the morning air so pure and exhilarating. At each succeeding portion of the day the atmosphere becomes more and more impure, and unfit for respiration; hence the night-air becomes injurious. It has been observed that all very old men were early risers; and no one, unaccustomed to it, can realize the delightful vigor imparted by breathing the morning air. To the absence of vegetation in cities, may be ascribed the insalubrity of their atmosphere, although, when they are so located as not to impede the free circulation of air, currents of wind carry away the noxious exhalations from living bodies, where they are soon decomposed by the ordinary operations of nature. In close cities, during the warm months, when there is scarcely a breath of air stirring, fatal epidemics are generated, and sweep off great numbers of the population. But the country has still another advantage over the city. The country people live far more simply; they have fewer delicacies; their tables are not so frequently loaded with sumptuous viands; their exercise is greater; they are not so dissipated; nor are they so often deprived of their necessary sleep.

Inhaling the fresh air early in the morning will invariably impart a ruddy tint to the complexion. Exposure to the fresh air increases the circulation of blood in the minute vessels of the skin, which gives to the skin that beautiful vermilion hue, which has long been an emblem of health. Nevertheless, there is a great difference between this roseate tint of the complexion, and that circumscribed redness which struggling nature implants in the face as an indication of internal distress, and which marks the secret progress of that fell destroyer of the human race, consumption. Of this latter class, how large a portion of our population is composed. A se-



clusion from the air invariably causes paleness, from the same cause that plants become white, when excluded from the light and air in a dark celler.

It has been often remarked, that American females lose their beauty at an early age; that they fade and wither almost in the very dawning of existence: they become sallow, and lose that animated expression which formerly beautified their countenances, while their eyes, sunken and lustreless, and their irritable dispositions, too plainly speak the ravages of their unnatural habits, and their almost entire devotion to the duties of domestic life. This is unjust, if not to themselves, at least to their children, on whom they can confer no greater benefit than bestowing good constitutions. They and their children, if they are desirous of preserving health and beauty, should go abroad as much as possible in the open air. Nothing is of more importance, I may also add, than admitting fresh air into the chambers of the sick, no matter what may be the disease.

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#### OF ALIMENT.

ALL food is either of animal or vegetable origin, the different varieties of which may be arranged as follows:

1. *Animal food*, such as the flesh of quadrupeds, of birds, and fishes; sometimes the *germs* of animals, as eggs; and the *animal secretion* called milk, subsequently converted into butter and cheese.

2. *The germs or seeds of vegetables*, such as wheat, rye, barley, oats, beans, peas, chesnuts, walnuts, &c.

3. *The seed-vessels of vegetables*, such as apples, pears, peaches, grapes, strawberries, blackberries, &c.

4. *The roots of vegetables*, such as potatoes, parsnips, beets, carrots, turnips, radishes, &c.

5. *The leaves of vegetables*, such as cabbage, lettuce, spinnage, &c.

6. *Infusions*, of animal and vegetable substances, as soup; of vegetable substances, as tea, coffee, &c.

7. *Fermented liquors*, such as the various descriptions of wine, ale, beer, porter, cider, &c.

8. *Distilled liquors*, as brandy, gin, and spirits.

9. *Water*.

10. *Narcotic substances*, as tobacco and opium.

11. *Condiments*, as pepper, mustard, &c.

By studying the habits of man, with regard to diet, we are unable to arrive at any definite knowledge of the natural food of his species. His present mode of living is altogether artificial. DR. PARIS says, that "there is scarcely a vegetable which we at present employ, that can be found growing naturally. Buffon states that our wheat is a factitious production, raised to its present condition by the art of agriculture. Rye, barley, and even oats, are not to be found wild; that is to say, growing naturally in any part of the earth, but have been altered, by the industry of mankind, from plants not now resembling them even in such a degree as to enable us to recognize their relations. The acrid and disagreeable *apium graveolens* has been thus transformed into delicious celery; and the *colewort*, a plant of scanty leaves, not weighing altogether half an ounce, has been improved into cabbage, whose leaves alone weigh many pounds, or into a cauliflower of considerable dimensions, being only the embryo of a few buds, which, in their natural state, would not weigh many grains. The potato, again, derives its origin from a small and bitter root, which grows wild in Chili, and at Monte Video. If there be any who feel sceptical on the subject of such metamorphoses, let him visit the fairy bowers of horticulture, and he will there perceive that her magic wand has not only converted the tough, coriaceous covering of the almond into the soft and melting flesh of the peach, but that, by her spells, the sour sloe has ripened into the delicious plum, and the austere crab of our woods into the golden pippin; that this again has been made to sport in endless variety, emulating in beauty of form and color, in exuberance of fertility and in richness of flavor, the rarer productions of warmer regions and more propitious climates."

Cultivation alters the whole aspect of nature. Plants, in a wild state, when removed and cultivated in our gar-

dens, become what naturalists call *monsters*. M. VIREY observes, "that by suppressing the growth of one part of a plant, we may respectively give rise to an increased developement in others; thus are some vegetables rendered eunuchs, or are deprived of seeds by obliteration, or only propagate themselves by slips; such a condition is frequently produced by culture, continued through a long succession of generations; this is the case with the *banana*, *sugar-cane*, and other fruits, that have carefully been made to deviate, through a long series of years, from their original types, and having been continually transplanted by slips, suckers, or roots, at length only propagate themselves in this way. Cultivation converts single into double flowers, by developing the stamens into petals."

Our domestic animals are also unlike the wild ones of the same species. The deviation has become at last so great, that the original stock from which the animals descended is doubtful. In the hog, the sheep, the cow, and the dog, we can no longer recognize the form and color of the wild ones from which they are descended. The spaniel and the hunting dog are both descended from the savage wolf, yet there is such a total change of form, color, habits, and disposition, that it would scarcely enter the mind that the dog and wolf belong to one and the same species.

Since both vegetables and animals are altered by cultivation, it is scarcely possible to decide upon the natural food of man, except by comparing his structure with that of wild animals. That he was not intended to subsist on animal food, we infer from his organization; the form of his teeth, and the structure of his alimentary canal, clearly indicate that he is not adapted to the devouring of flesh. The ourang-outang, and other animals of the monkey tribe, are strictly *frugivorous*, that is to say, they feed upon *fruits*. By comparing them with man, we find that the shape of the teeth, and that of the alimentary canal, are remarkably similar in both; hence it is reasonable to conclude that man is likewise a fruit-devouring animal.

“Not to mention the braxy of Scotland, (which is putrid mutton, the sheep having died of the rot,) it is notorious that game and venison are seldom relished till they are ‘*high*,’ or, in honest and faithful language, till they are a mass of putrefaction, and disengaging, in abundance, one of the most septic poisons that the chemist knows of.”

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ANIMAL FOOD.

MUCH controversy has existed between dietetic writers, respecting the natural food of man. Some assert that he was formed to live upon a diet purely vegetable; while others contend that his diet should consist of animal and vegetable food. We are told, “that, in the golden age, man was as innocent as the dove; his food was acorns, and his beverage, pure water from the fountain. Finding, every where, abundant subsistence, he felt no anxieties, but lived independent, and always in peace, both with his own species, and the other animals. But he no sooner forgot his native dignity, and sacrificed his liberty to the bonds of society, than war, and the iron age, succeeded that of gold and peace. Cruelty, and an insatiable appetite for flesh and blood, were the first fruits of a depraved nature, the corruption of which was completed by the invention of manners, arts, and sciences. Either immediately, or remotely, all the physical or moral evils, by which individuals are afflicted, and society laid waste, arose from these carnivorous practices.”

Whether such a state of exalted temperance, pure liberty, and blissful peace ever existed, it is difficult to decide; but science, ever striving to develope the harmony and simplicity of nature’s laws, proffers its aid to dispel our doubts, and decide the question. “Comparative anatomy teaches us that man resembles frugivorous (fruit-devouring) animals in every thing, and carnivorous (flesh-devouring) in nothing; he has neither claws wherewith to seize his prey, nor distinct and pointed teeth wherewith to tear the living fibre. A



Mandarin, of the first class, with nails two inches long, would probably find them alone inefficient to hold even a hare. After every subterfuge of gluttony, the bull must be degraded into the ox, and the ram into the wether, by an unnatural and inhuman operation, that the flaccid fibre may offer a fainter resistance to rebellious nature. It is only by softening and disguising dead flesh, by culinary preparation, that it is rendered susceptible of mastication or digestion; and that the sight of its bloody juices and raw horror does not excite intolerable loathing and disgust. Let the advocate of animal food force himself to a decisive experiment on its fitness; and, as Plutarch recommends, tear a living lamb with his teeth, and, plunging his head into its vitals, slake his thirst with the streaming blood; when fresh from the deed of horror, let him revert to the irresistible instinct of nature that would rise in judgment against it, and say, Nature formed me for such a work as this! Then, and then only, would he be consistent."

Comparative anatomy teaches us that carnivorous animals are so constructed that animal food is not only the appropriate stimulus to their organs, but that they could not long exist in a healthy state with any other diet. The herbivorous animals, also, have a digestive apparatus suited to a purely vegetable diet; an apparatus that would not answer for the digestion of animal food. If man was destined to devour the flesh of animals, might we not, then, reasonably infer that his organs would correspond with his aliment? Or is man a "proud exception to all nature's laws," that he should not be instinctively impelled, in common with other animals, to seek a species of food adapted to his organization? It is true, that man has monopolized the right of breaking the laws of nature—but he has paid the penalty of his transgression. If every horrid form of loathsome disease—if violent and premature death—if the vice, and misery, and suffering that surround us, do not indicate that the vengeance of nature has been prompt and terrible, it proves that there may be effects without legitimate causes.

DR. LAMB infers from the teeth, stomach, and intestines of man, that his natural food is vegetables. Other anatomists have maintained the same opinion.

BARON CUVIER, universally acknowledged as the best naturalist the world ever produced, and whose knowledge of comparative anatomy renders him competent to decide, remarks:—"The natural food of man, judging from his structure, appears to consist of the fruits, roots, and other succulent parts of vegetables: his hands offer him every facility for gathering them; his short, and but moderately strong jaws on the one hand, and his *canini* being equal in length to the remaining teeth, and his tubercular *molars* on the other, would allow him neither to feed on *grass* nor to devour *flesh*, were these aliments not previously prepared by cooking."

There are sixteen teeth in each jaw. The middle teeth, being four in number, are called *incisores*; the next two, one on each side, are termed *cuspidati*, (in common language, *canine teeth*, or *eye-teeth*;) then, counting backwards, the next four, two on each side, are called *bicuspidates*; and the remaining six, three on each side, (being the double teeth) are called *molars*.

DR. BELL observes, in his work on the Teeth—"It appears that the structure and uses of the teeth are more perfectly equalized in the human subject than in any other animal. It is true that in some tribes of animals, whose habits require the greatest possible extension of the office of a particular class of the teeth, a corresponding developement of that class is found to take place, to a much greater degree than in man.

"Thus, in the *carnivora*, the *cuspidati* are greatly elongated and strengthened, in order to enable them to seize their food and to tear it in pieces; in the *rodentia*, or gnawing animals, as in the beaver, for instance, the *incisors* are remarkably long, and exhibit that extraordinary developement which their peculiar habits demand, and in the *graminivorous* animals, the *ruminantia* especially, the *molars* are found to occupy the most conspicuous situation. But, in each of these instances, the other kinds of teeth are found to be proportionably of

less importance, and, in some cases, are actually wanting. In man, on the contrary, every class appears to be equally developed, to a moderate, though a sufficient degree, and to exhibit a perfection of structure which may be considered as being the true type from which all others are mere deviations. It becomes, therefore, a question of some interest, and perhaps no less difficulty, to what food the structure which has just been demonstrated is particularly adapted. The opinion which I venture to give has not been hastily formed, nor without what appeared to me sufficient grounds.

“We may be led, by a careful examination of the structure of the different organs, and by an analogical comparison of them, as they exist in man, with the same organs in those animals which most nearly resemble him in structure, but which are still found in a perfectly natural state, to a plausible supposition, at least, of what were originally his natural habits; and which would have still continued so, but for those changes which have arisen from the possession of reason.

“With this view of the subject, it is not, I think, going too far to say, that every fact connected with the human organization goes to prove, that man was originally formed a *frugivorous* (fruit-devouring) animal, and therefore probably tropical, or nearly so, with regard to his geographical situation. This opinion is principally derived from the formation of his *teeth* and *digestive organs*, as well as from the character of his *skin*, and the general structure of his *limbs*. It is not my intention now to go farther into the discussion of this subject than to observe, that if *analogy* be allowed to have any weight in the argument, it is wholly on that side of the question which I have just taken. Those animals whose teeth and digestive apparatus most nearly resemble our own, namely, the apes and monkeys, are undoubtedly *frugivorous*; but as, from their organization, they are necessarily tropical animals, and without the gift of reason, by which they might have overcome the difference of temperature by artificial means, they remain still restricted to their original food, and confined to the

very limited climate to which their structure peculiarly adapted them. The reasoning powers of man, on the contrary, have enabled him to set climate at defiance, and have rendered him, in all cases, more or less an artificial being."

The celebrated PROFESSOR LAWRENCE adds his testimony in the following words:—

"The *molar* teeth, being the instruments employed in dividing and preparing the food, must exhibit, in figure and construction, a relation to the nature of the aliment. They rise, in the true *carnivora*, or flesh-devouring animals, into sharp-pointed prominences; and those of the lower shut within those of the upper jaw; when the series is viewed together, the general outline may be compared with the teeth of a saw. These animals are also furnished with long, pointed, and strong *cuspidati*, or canine teeth, which are employed as weapons of offence and defence. The herbivorous animals are not armed with these terrible canine teeth; their *molares* have broad flat surfaces, opposed, in a vertical line, to each other, in the two jaws.

"The articulation of the lower jaw differs in the two cases as much as the structure of the teeth. In the *carnivora* it can only move backwards and forwards; all lateral motion (that is, from side to side) being precluded by the rising edges of the glenoid cavity: in the *herbivora* it has, moreover, motion from side to side. Thus we observe, in the flesh-eaters, teeth calculated only for tearing, subservient, in part at last, to the procuring of food, as well as to purposes of defence; and an articulation of the lower jaw that precludes all lateral motion. In those who live on vegetables, the form of the teeth, and the nature of the joint, are calculated for the lateral or grinding motion. The former, having rudely torn and divided the food, swallow it in masses, while, in the latter, it undergoes considerable comminution before it is swallowed. The teeth of man have not the *slightest resemblance* to those of carnivorous animals, except that their enamel is confined to the external surface. He possesses, indeed, teeth called canine, but



they do not exceed the level of the others, and are obviously unsuited to the purposes which the corresponding teeth execute in carnivorous animals. In the freedom of lateral motion, the human lower jaw most nearly resembles that of the *herbivora*.

“The teeth and jaws of man are, in all other respects, much more similar to those of monkeys, than of any other animals. A skull, apparently of the ourang-outang, in the Museum of the College, has the first set of teeth; the number is the same as in man, and the form so closely similar that they might easily have been mistaken for human. In most other simiæ, or animals of the monkey kind, the canine teeth are much longer and stronger than in us; and so far these animals have a more carnivorous character.

“The length and divisions of the alimentary canal are very different according to the kind of food. In the proper carnivorous animals the canal is very short; the large intestine cylindrical, and the *cæcum* not larger than the rest. The form of the stomach, and the disposition of its openings, are calculated to allow a quick passage of the food. In the herbivora, the whole canal is long; and there is either a complicated stomach, or a very large *cæcum* and a *sacculated colon*: the stomach, even where simple, is formed so as to retain the food for a considerable time.

“Thus we find, that, whether we consider the teeth and jaws, or the immediate instruments of digestion, the human structure closely resembles that of the simiæ (monkey-kind); all of which, in their natural state, are completely herbivorous.”

“That man is not, by nature, destined to devour animal food, is evident from the construction of the human frame, which bears no resemblance to wild beasts, or birds of prey. Man is not provided with claws, or talons, with sharpness of fangs, or tusk, so well adapted to tear and lacerate; nor is his stomach so well braced and muscular, nor his animal spirits so warm, as to enable him to digest this solid mass of animal flesh. On the contrary, nature has made his teeth smooth, his

mouth narrow, and his tongue soft; and has contrived, by the slowness of his digestion, to divert him from devouring a species of food so ill-adapted to his frame and constitution. But, if you still maintain that such is your natural mode of subsistence, then follow nature in your mode of killing your prey, and employ neither knife, hammer, nor hatchet; but, like wolves, bears, and lions, seize an ox with your teeth, grasp a boar round the body, or tear asunder a lamb or a hare, and, like the savage tribe, devour them still panting in the agonies of death.

“We carry our luxury still farther, by the varieties of *saucés* and *seasonings* which we add to our beastly banquets, mixing together oil, wine, honey, pickles, vinegar, and Syrian and Arabian ointments and perfumes, as if we intended to *bury* and *embalm* the carcasses on which we feed. The difficulty of digesting such a mass of matter, reduced, in our stomachs, to a state of liquefaction and putrefaction, is the source of endless disorders in the human frame.”

Having proved that Nature, in constructing the human frame, never intended that man should eat flesh, we find these arguments strengthened by the testimony of those who have abstained from animal food, and who declare it to be exceedingly pernicious. That animal food is *unnecessary* may be abundantly proved; that it is *injurious* may be demonstrated with equal facility.

“As, in every period of history (says Dr. LAMBE) it has been known, that fruits and vegetables alone are sufficient for the support of life, and that the bulk of mankind live upon them at this hour, the adherence to the use of animal food is no more than a persistence in the gross customs of savage life, and evinces an insensibility to the progress of reason, and to the operation of intellectual improvements.”

The monks of Monte Santo (Mount Athos) never taste animal food,—they live on vegetables, olives, and cheese. In the year 1806, one of the fraternity was in good health at the great age of one hundred and twenty years.

“The four most ancient order of priests, the Rahans, the Bramins, the Magi, and the Druids, confined themselves to vegetable food, as did also the Athenian prince, Triptolemus, who established the Eleusinian mysteries, and prohibited by law all injury to animals.”

“The Indian Bramins (says DR. CLARKE) neither kill nor eat any sort of animal; and it is certain they have not done it for more than two thousand years.”

DR. HECQUET, who died in Paris, 1773, had not eaten any meat, nor drank any thing stronger than water, for thirty years. He was the Sangrado of Cervantes.

ANDREW FORDYCE, a surgeon of London, rigidly abstained from the use of flesh-meat. His oldest acquaintances do not recollect of his tasting animal food.

SIR RICHARD PHILLIPS, Sheriff of London, maintained that the human frame was not intended to be nourished by animal food. At the age of 21 he abandoned the use of meat. In some of his published letters, signed “Common Sense,” he says—“from that day I date my lease of life. It now exceeds *thirty years* since I have tasted animal food. It was early prophesied that a vegetable diet would kill me, but, to the surprise of my friends, I am now enjoying vigorous health.”

MR. JOHN TWEDDELL, in one of his letters, thus relates his own experience:—“I no longer eat flesh meat, nor drink fermented liquors. As for the latter, it is because I do not believe that they can ever be good for the constitution, and still more especially with a vegetable diet. With regard to the flesh of animals, I have many times thought on the subject. I am persuaded we have no other right than the right of the strongest, to sacrifice to our monstrous appetites the bodies of living things, of whose qualities and relations we are ignorant. Different objections which struck me, as to the probability of good from the universality of this practice, have hitherto held me in indecision.

“I doubted whether, if this abstinence were universal, the animals which we now devour, might not devour, in their turn, the fruits and vegetables reserved for our sustenance. I do not know whether this would be so,

but I do not believe it: it seems to me that their numbers would not augment in the proportion which is apprehended. If, on the one hand, we now consume with our teeth, on the other, we might then abandon our inventions and schemes for augmenting the means of propagation. Let Nature follow her own course with regard to all that lives. I am told they would destroy each other: in the first place the two objections cannot exist together; if they would destroy each other, their numbers would not be excessive. And what is this mutual destruction to me? Who has constituted me dictator of the realms of Nature? Why am I umpire between the mistress and her servants? Because two chickens fight till one dies, am I obliged to worry one of them to prevent the engagement? Exquisite and well-imagined humanity!

“On the other hand, let precautions be adopted against famine, when experience shall have shown the necessity of them; in the mean while, we are not called upon to bury in our bowels the carcasses of animals, which, a few hours before, lowed or bleated; to flay and to dismember a defenceless creature; to pamper the unsuspecting beast that grazes before us, with the single view of sucking his blood and grinding his bones; and to become the unnatural murderers of beings, of whose powers and faculties, of whose modes of communication and mutual intercourse, of whose degree of sensibility and extent of pain and pleasure, we are necessarily and fundamentally ignorant.”

“I have wandered (says the celebrated DR. JACKSON) a good deal about the world, and never followed any prescribed rule in any thing; my health has been tried in all ways, and, by the aids of temperance and hard work, I have worn out two armies in two wars, and probably could wear out another before my period of old age arrives. I eat no *animal food*, drink no wine or malt liquor, or spirits of any kind; I wear no flannel, and neither regard wind nor rain, heat nor cold.”

“The Brazilians, (says SIR JOHN SINCLAIR) when first discovered by the Europeans, lived the most natu-



ral, original lives of mankind, so frequently described in ancient countries, before laws, or property, or arts, made entrance among them: they lived without labor, farther than for their necessary food, by gathering fruits, herbs, and plants; they knew no drink but water; were not tempted to eat or drink beyond common thirst or appetite; were not troubled with either public or domestic cares, nor knew any pleasure but the most simple and natural."

When CAPTAIN COOK visited the New Zealanders, he observed that among all those who crowded around him, young and old, men and women, not one appeared to have any bodily complaint; not the slightest eruption could be seen upon their skins; and when they received a wound it healed without applications, in a remarkably short space of time. Water, as far as could be ascertained, was the universal and only beverage; and flesh-meat was not in use among them.

"The chief food of the Japanese is rice, pulse, fruits, roots, and herbs; but mostly rice, which they have in great plenty and perfection."

BURKHART, in describing his journey through the deserts of Arabia, says—"The frugality of these Bedouins (Arabs of the Desert) is indeed without example. My companions, who walked at least five hours every day, supported themselves for four-and-twenty hours, with a piece of dry *black bread*, of about a pound and a half in weight. I endeavored, as much as possible, to imitate this abstemiousness, being already convinced, from experience, that it is the best preservative against the effects of such a journey."

The much-abused EPICURUS, the founder of the Epicurean system of philosophy, together with his pupils, rigidly abstained from the use of animal food. PYTHAGORAS, who lived to a very advanced age, as did also his follower, the philosopher XENOPHILUS, used no animal food, because they believed that killing an animal was in effect killing another self, believing, as they did, in the transmigration of souls. Most of the ancient Grecian philosophers abstained from flesh-meat. The black

broth of the Spartans is familiar to most readers; and a more hardy, braver people never existed. It was a maxim of the ancients, that "none could understand God and his works, and enjoy perfect health and long life, but those that abstain from *flesh*, wine, and vices, bounding their desires according to the ends and necessities of nature."

The primitive Christians of the East, who retired from persecution into the deserts of Arabia and Egypt, lived healthfully and cheerfully on twelve ounces of bread per day with mere water; with this diet, St. Anthony lived 105 years; James the Hermit, 104; Arsenius, 120; St. Epiphanius, 115; Simeon, the Stylite, 112; and Romauld, 120.

"Abstinence from animal food (says SHELLEY) subtilizes and clears the intellectual faculties."

"Vegetable aliment, (says DR. CULLEN) as never over-distending the vessels, or loading the system, never interrupts the stronger motions of the mind, while the heat, weight, and fulness of animal food are an enemy to its vigorous efforts."

SIR ISAAC NEWTON, while composing his celebrated treatise on Optics, confined himself to a vegetable diet.

DR. FRANKLIN, in his early days, confined himself to a vegetable diet, and he mentions that his progress in study was proportionate to that clearness of ideas, and quickness of conception, resulting from great temperance in diet.

"The large majority of mankind (says the JOURNAL OF HEALTH) do not eat any animal food, or so sparingly, and at such long intervals, that it cannot be said to form their nourishment. Millions in Asia are sustained by rice alone. In Italy, and southern Europe generally, bread made of the flour of wheat or Indian-corn, with lettuce and the like mixed with oil, constitutes the food of the most robust part of its population. The Lazzaroni of Naples, with forms so active and finely proportioned, cannot even calculate on this much; coarse bread and potatoes is their chief reliance. Hundreds of thousands, we might say millions, of the Irish, do

not see flesh-meat or fish from one week's end to the other; potatoes and oat-meal are their articles of food: yet where shall we find a more healthy and robust population, or one more enduring of bodily fatigue, and exhibiting more mental vivacity? What a contrast between these people and the inhabitants of the extreme north, the timid Laplanders, Esquimaux, and Samoideans, whose food is almost entirely animal!"

"The result of my own observation and experience (says DR. RICKESON) both on my own constitution and those of others, has led me to believe that a *vegetable diet* is most consistent with, and conducive to ease, health, and longevity; for I have generally observed such to enjoy the most uninterrupted health, to be subject to the fewest diseases, the mildest symptoms, and the least mortality; while, on the contrary, I have frequently remarked that those who live much on animal and highly seasoned food, are oftener indisposed, and peculiarly liable to both inflammatory and putrid disorders, attended with violent symptoms and great mortality. Indeed, I think I foresee the time, and that perhaps ere long, when men will endure the heat and fatigues of labor, without much animal food, with nearly as great certainty, success, and improvement of their health, as, within a few years, they have found they can do without spirituous liquors."

"A too frequent use of animal food (says DR. WIL-  
LICH) disposes the fluids strongly to putrefaction, and, I believe, in some sanguine temperaments, communicates to the mind a degree of ferocity. Even a child will refuse the breast, when its nurse has eaten too much animal food. Those who eat great quantities of meat, and little bread or vegetables, must, necessarily, acquire an offensive breath."

"When the stomach (says DR. CULLEN) is repeatedly overcharged with full meals of animal food, it will lose its natural tone, by such frequent plenitude and over-distention; and its contents being indigested, the chyle obtained from it will be crude, impure, and insufficiently elaborated. The several secretions being also

unduly performed, a foundation will be laid for chronic diseases, especially the gout and scurvy, dropsy and hypochondriacal disorders."

"The use of swine's flesh (says DR. CLARKE) in union with ardent spirits, is, in all likelihood, the grand cause of the scurvy, which is so common in the British nation, and which would probably assume the form and virulence of a leprosy, were our climate as hot as that of Judea."

"From whatever cause (says DR. LEAKE) the stomach is deprived of its natural digestive faculty, it may be laid down as a general rule, that a spare diet, and abstinence from animal food, will afford relief."

"Animal food (says DR. TURNBULL) when prematurely and excessively used, as is too frequently done with children, tends to bring on too early a maturity, to exhaust the system, and, of course, to induce, in the same proportion, a rapid decay. Excess of animal food makes men fat and plethoric; and disease is the unavoidable consequence of this state of repletion."

"Animal food (says DR. PARIS) is too highly stimulant—the springs of life are urged on too fast; and disease necessarily follows."

"Animal food (says DR. JONES) excites, by its stimulating qualities, a temporary fever after every meal, by which the springs of life are urged into constant, preternatural, and weakening exertions. Persons living on it chiefly, are subject to acute and fatal disorders, as scurvy, malignant ulcers, inflammatory fevers, and corpulency. We seldom see those who indulge much in this diet remarkable for longevity."

"There is no disease, (says SHELLEY) bodily or mental, which adoption of vegetable diet and pure water has not infallibly mitigated, wherever the experiment has been fairly tried. Debility is gradually converted into strength, disease into healthfulness: madness, in all its hideous variety, from the ravings of the fettered maniac, to the unaccountable irrationalities of ill-temper, that make a hell of domestic life, into a calm and considerate evenness of temper, that alone might offer a certain



pledge of the future moral reformation of society. But it is found easier, by the short-sighted victims of disease, to palliate their torments with *medicine*, than to relieve them by *regimen*."

"The facility (says Dr. KENDALL) with which animal food is to be procured in cities, in comparison with an uncivilized state of things, is another cause of the excess in which it is consumed. It is said *excess*, for there is but one voice on this subject. All know that animal food is consumed, by every Briton that can purchase it, in a degree at once not only unnecessary, but actually destructive to the health of himself and calamitous to the community.

"That it is unnecessary to his sustenance, is evident from the health and strength of those, who, from habit or necessity, do not partake of it in any proportionate degree. Animal food is said to give strength; yet the most laborious class of the people eat of it the least.

"With respect to the health of body and mind: to the first, animal food is likely to prove destructive, by inducing, besides other evils, plethora and all its consequences; and to the mind the favorableness of the vegetable is matter of general belief."

A general objection to abstinence from animal food arises from the fear expressed, that animals would increase too rapidly; but we know that in India the law forbids the destruction of animal life, yet neither the ox nor the sheep increase in such a ratio as to excite alarm. Horses, which are not destroyed either in Europe or in America, are not likely to become so numerous as to overrun those countries.

The ground employed to fatten and nourish animals sufficient for the consumption of one family, would, if properly cultivated, yield enough to support five families; and hence, if population should ever increase to the extent that has been apprehended, the rearing of animals would be a serious evil.

Animal food is a powerful stimulus to the whole system; it increases the circulation, excites a temporary fever, and facilitates perspiration. The constant repe-

tition of such unnatural stimuli, at length wears out the system, and those who have been much addicted to their use, either die prematurely, or linger through a miserable existence, afflicted with the most distressing chronic disorders.

The effects of animal food on the moral character is one of the most deplorable evils arising from its use. It communicates to some minds a coarseness and ferocity of disposition, and renders the temper irritable and petulant; the passion of anger is either induced or strengthened by its use. We all know that those animals which feed on flesh, are savage, cruel, and ferocious; on the contrary, those which feed on vegetables are mild and inoffensive. What a contrast between the tiger, renowned for his cruel, savage, and treacherous disposition, and the inoffensive lamb, which we have adopted as the emblem of innocence! So universal was this belief among the ancients, that they have ascribed the origin of wars to the destruction of animal life. Indeed, if a people religiously abhorred the idea of shedding the blood of an innocent animal, can we believe that their voices would ever rise in shouts of exultation over the smoking ruins of a city, whose streets were deluged by the blood of its inhabitants? Thousands who now use animal food, would abandon it for ever, if they were obliged to slaughter the innocent victims themselves; and even when they are slaughtered, every process and art of cookery, and the addition of stimulating spices, must be employed, to overcome the disgust which naturally arises from the idea of devouring the dead flesh of animals. The cruelty of destroying animal life has been feelingly portrayed by that elegant descriptive poet, Thomson:—

“For, with hot ravine fir’d, ensanguin’d MAN  
Is now become the lion of the plain,  
And worse. The wolf, who, from the nightly fold  
Fierce drags the bleating prey, ne’er drunk her milk,  
Nor wore her warming fleece: nor has the steer,  
At whose strong chest the deadly tiger hangs,  
E’er plough’d for him. They too are temper’d high,  
With hunger stung and wild necessity;  
Nor lodges pity in their shaggy breast.  
But man, whom nature form’d of milder clay,

With ev'ry kind emotion of the heart,  
 And taught alone to weep: while, from her lap,  
 She pours ten thousand delicacies, herbs,  
 And fruits, as numerous as the drops of rain,  
 Or beams that gave them birth: shall he, fair form,  
 Who wears sweet smiles, and looks erect on heav'n,  
 E'er stoop to mingle with the prowling herd,  
 And dip his tongue in gore?"

"You ask me (says PLUTARCH) for what reason Pythagoras abstained from eating the flesh of brutes; for my part, I am astonished to think what first induced man to taste of a dead carcass; or what motive could suggest the notion of nourishing himself with the loathsome flesh of dead animals."

"The moral effect of aliment (says JEAN JACQUES ROUSSEAU) is clearly evinced in the different tempers of the carnivorous and frugivorous animals. The former, whose destructive passions, like those of ignorant man, lay waste all within their reach, are constantly tormented with hunger, which returns and rages in proportion to their devastation; this creates that state of warfare or disquietude which seeks, as in murderers, the night and the veil of the forest; for, should they appear on the plain, their prey escapes, or, seen by each other, their warfare begins. The frugivorous animals wander tranquilly on the plains, and testify their joyful existence by frisking and basking in the genial rays of the sun, or browsing with pleasure on the green herb. The same effect of aliment is discernible among the different species of men; the peaceful temper of the frugivorous Asiatic is strongly contrasted with the ferocious disposition of the carnivorous European."

"The particular effects (says DR. TURNBULL) of this difference of aliment on the human body, we have an opportunity of contemplating in the habits of certain votaries who exclusively use each. Thus, those tribes, as the Tartars, who live solely on animal food, possess a degree of ferocity of mind, and fierceness of character, which form the leading features of all carnivorous animals. On the other hand, an entire diet of vegetable matter gives to the mind a gentleness, softness, and mildness of feelings, as appears from the Gentoo."

**"When children (says BERNARDIN DE ST. PIERRE) are barbarous toward innocent animals, they will soon become the same toward men. Caligula, before imbruing his hands in human blood, had made a practice of destroying flies. It may be said, that the moral behavior of man to man commences, in some measure, with that of an infant toward insects. Never, therefore, let a child acquire a truth by means of a vice; nor extend its understanding at the expense of its heart. Let it not study the laws of nature in the pangs of sentient beings; but rather in the succession of their enjoyments."**

**"Most animals (says DR. WATERHOUSE) live in amity; but man is the enemy of all; and, unlike those ferocious creatures who kill from motives excited by want and hunger, man kills every thing for sport, aversion, fear, superstition, wantonness, and often for the mere sake of seeing that dead which was living in enjoyment. In consequence, he destroys the natural circle of existence, and reduces countries, which he inhabits, to deserts, like the once fertile kingdoms of Assyria, Babylonia, Nineveh, Judea, Syria, &c."**

**The ENCYCLOPÉDIE METHODIQUE observes, that the "man who sheds the blood of an ox or sheep, will be habituated more easily than another to witness the effusion of that of his fellow-men; inhumanity takes possession of his soul; and the professions whose object is to sacrifice animals for the purpose of supplying the supposed necessities of men, impart, to those who exercise them, a ferocity which their relative connections with society but imperfectly serve to mitigate."**

**The ABBE GALLANI ascribes all social crimes to animal destruction; thus, treachery to angling and ensnaring; and murder to hunting and shooting; and he asserts, "that the man who would kill a sheep, an ox, or any unsuspecting animal, would kill his neighbor but for the law."**

**"Among the Wallachians, (says DR. ALEXANDER) though there is no positive institution to the contrary, yet the women never destroy the life of any creature. Whether this custom were founded by some of their**



ancient legislators, or whether it originated from accidental circumstances, is uncertain ; but however that be, nothing can be more suitable to the gentleness and timidity which form the most beautiful and engaging part of the female character."

"Nothing can be more shocking (says POPE) or horrible, than one of our kitchens sprinkled with blood, and abounding with the cries of creatures expiring, or with the limbs of dead animals scattered or hung up here and there. It gives one an image of a giant's den in romance, bestrewed with the scattered heads and mangled limbs of those who were slain by his cruelty."

"India, in fact, (says OVERTON) of all the regions of the earth, is the only public theatre of justice and tenderness to brutes, and all living creatures ; for there, not confining murder to the killing of man, they religiously abstain from taking the life of the meanest animal."

"Pythagoras (says RICHERAND) believed that a purely vegetable diet conveyed into the blood bland and mild principles,—because blood, procured from vegetable chyme, was not so stimulating, excited the organs less, rendered it easier to observe the laws of temperance, the original source of virtue.

"The carnivorous species are marked by their courage, their strength, and their ferocity ; and savages, who live by hunting, and feed on raw, bloody, and palpitating flesh, are the most ferocious of men.

"In France, in the midst of those scenes of horror which we have witnessed, and from which we have suffered, it was observed that butchers were foremost in the massacres, and in all the acts of atrocity and barbarity. It has been said that the habit of slaying animals had familiarized them with the shedding of human blood."

"The Gentoos (says M. DE PAGE) rear numerous herds of cattle ; but such is their veneration for these animals, on account of their useful and patient services to man, that to kill, or even maim one of them is deemed a capital offence."

That animal food tends to make man savage and ferocious, there can be no doubt; but that it makes him "strong and courageous, is fully disproved by the inhabitants of northern Europe and Asia, the Laplanders, Samoiedes, Ostiaks, Tungooses, Burats, and Kamtschatdales, as well as by the Eskimaux in the northern, and the natives of Terra del Fuego in the southern extremity of America; which are the *smallest, weakest, and least brave people* of the globe, although they live almost entirely on flesh, and that often raw.

"Vegetable diet is as little connected with *weakness* and *cowardice* as that of animal matters is with physical force and courage. That men can be perfectly nourished, and their bodily and mental capabilities be fully developed in any climate, by a diet *purely vegetable*, admits of abundant proof from experience. In the periods of their *greatest simplicity, manliness, and bravery*, the Greeks and Romans appear to have lived, almost entirely, on plain vegetable preparations: indifferent bread fruits, and other produce of the earth, are the chief nourishment of the modern Italians, and of the mass of population in most countries of Europe: of those more immediately known to ourselves, the Irish and Scotch may be mentioned, who are certainly not rendered weaker than their English fellow-subjects by their freer use of vegetable aliment. The Negroes, whose great bodily powers are well known, feed chiefly on vegetable substances; and the same is the case with the South-Sea Islanders, whose agility and strength were so great, that the stoutest and most expert English sailor had no chance with them in wrestling and boxing."

"All the rack and the ingenuity of cruelty and torture have been exhausted, to supply the cravings of a depraved and degraded appetite, and one which human nature might well be ashamed of; the bull may be no longer *baited* for this purpose, but pigs are still whipped to death; lobsters are boiled alive; cod are crimped; and eels are skinned, writhing in agony; not to mention geese, which are duly nailed to the floor by their webbed feet, that they may repose and fatten; turkeys are

crammed and finally bled to death under the tongue; hares are hunted, and die in fevered inflammation, or it may be, duly inoculated with the poison of hydrophobia, from dogs excited to madness by the chase. Now all these practiced cruelties, though they may blanch the codfish, or tinge the lobster with ruby, excite inflammatory action in the animal suffering them, and inflamed surfaces evolve poisonous matter."

Animals, who kill each other for a supply of nourishment, exercise no such cruelty. "They are impelled (says COMBE) to inflict death in the most instantaneous and least painful method; the tiger and lion spring from their cover with the rapidity of the thunderbolt, and one blow of their tremendous paws, inflicted at the junction of the head with the neck, produces instantaneous death. The eagle is taught to strike its sharp beak into the spine of the birds which it devours, and their agony endures scarcely for an instant. It has been objected, that the cat plays with the unhappy mouse, and prolongs its tortures; but the cat that does so, is the pampered and well-fed inhabitant of a kitchen; the cat of nature is too eager to devour to indulge in such luxurious gratifications; it kills in a moment, and eats. Man is not so merciful toward the lower creatures. But he does not, with impunity, add one unnecessary pang to the death of the lower animals. The brutal butcher who inflicts torments on calves, sheep, and cattle, while driving them to the slaughter, and who bleeds them to death, by successive stages, prolonged for days, to whiten their flesh—is necessarily excluded from all the enjoyments attendant on the supremacy of the human faculties; he, besides, goes into society under the influence of the same base combination, and suffers at every hand animal retaliation, so that he does not escape with impunity for his outrages against the moral law."

If the arguments adduced be true, that is to say, if the use of animal food be unnatural; if it be unnecessary; if it be injurious to the bodily health; if it affects the intellect; and if it arouses and excites all the bad passions of human nature, what excuse can those who

eat it urge in their defence? They certainly will not confess a weakness of mind which precludes the fulfilment of a resolution to abandon it; and they cannot, with any appearance of reason, advocate the taking of life which they have not the power to restore.

Abstinence from animal food not only communicates calmness and gentleness to the disposition, but it contributes, in a wonderful degree, to personal beauty. It is scarcely possible to imagine the effect which a well-regulated vegetable diet and moderate exercise, produce in the developement of a finely-moulded form and beautiful countenance, provided such education be adopted in infancy; more especially if the mental faculties are gradually and properly cultivated.

“The nations that subsist on vegetable diet (says **ST. PIERRE**) are, of all men, the handsomest, the most robust, the least exposed to diseases and violent passions; and they attain the greatest longevity. The Bramins of India, who frequently survive a century, eat nothing but vegetables. From the Pythagorean school, Epaminondas issued forth, so renowned for his virtues; Archytas, so celebrated for his skill in mechanics; and Milo of Crotona for his strength. As vegetable diet has a necessary connection with many virtues, and excludes none, it must be of importance to accustom young people to it, seeing its influence so powerfully contributes to beauty of person and tranquility of soul. The children of the Persians, in the time of Cyrus, and by his orders, were fed with bread, water, and cresses; and Lycurgus introduced a considerable portion of the physical and moral regimen of these children into those of Lacedæmon. Such diet prolongs infancy, and, of course, the duration of human life.”

“Like other hermits (says the author of a **YEAR IN SPAIN**) the Hermano Mayor wore a large garment of coarse cloth, girded round the middle with a rope, and had a hood for the head. Yet there was something in his appearance which would have enabled one to have selected him out at once from a whole fraternity. He had a lofty and towering form and features of the very



noblest mould. This man was such a one as, in any dress or situation, a man would have turned to look at a second time ; but, as he now stood before me, in addition to the effect of his apostolic garment, his complexion and his eye had a clearness that no one can conceive, who is not familiar with the aspect of those who have practiced a long and rigid abstinence from *animal food* and every exciting aliment. It gives a lustre, a spiritual intelligence to the countenance, that has something in it saint-like and divine."

The effect of vegetable aliment in beautifying the complexion is simply and forcibly expressed in the first chapter of the book of Daniel. Daniel, and three of his companions, were carried as captives to Babylon ; and were selected, from among the other prisoners, to stand in the king's palace : to render them fleshy and fair, the king ordered them a certain portion of his meat and wine.

"But Daniel purposed in his heart that he would not defile himself with the portion of the king's meat, nor with the wine which he drank ; therefore he requested, of the prince of the eunuchs, that he might not defile himself. And the prince of the eunuchs said unto Daniel, I fear my lord, the king, who hath appointed your meat and your drink : for why should he see your faces worse liking than the children which are of your sort ?

"Then, said Daniel, prove thy servants, I beseech thee, ten days : give us *pulse* to eat and *water* to drink. Then let our countenances be looked upon before thee, and the countenances of the children that eat of the portion of the king's meat : and as thou seest, deal with thy servants.

"So he consented to them in this matter, and proved them ten days. And at the end of ten days their countenances appeared fairer and fatter in flesh than all the children which did eat the portion of the king's meat."

This simple narrative is so much in accordance with the known principles of diet, that it requires no comment.

"It has been observed by travellers, that no where are fairer complexions to be found than in those parts

of England, Ireland, Scotland, and Germany, where the living is almost exclusively vegetable. Some, I know, have attributed this to climate; but an abundance of facts can be produced, which prove that diet also has considerable influence.

“It has been ascertained that the teeth are uniformly best in those countries where the least animal food is eaten. In those parts of Ireland, Scotland, England, and Germany, where the common classes subsist almost entirely on bread, potatoes, and other articles from the vegetable kingdom, they have fine white teeth; and, in other districts, where any considerable quantity of animal food is used, the teeth are perceptibly less sound and beautiful.”

Almost every one is familiar with the history of Caspar Hauser, the unfortunate youth who was confined in a narrow apartment, and never saw but one human being from the time of his remembrance until he quitted his dungeon, a period of 17 years. During that time he had tasted no other food but bread and water. When he was first observed, meat was offered to him, the very sight and smell of which powerfully convulsed his whole frame, and he rejected it with visible horror; but eagerly swallowed some bread and water.

His senses were remarkably acute, and he possessed an extraordinary memory. With the acuteness of his senses his memory declined, and both were singularly coincident with a change of diet. Caspar observed, in regard to his hearing, that “its acuteness had been considerably diminished since he had learned to eat meat.” PROFESSOR DAUMER, of the Nuremburg Gymnasium, remarks: “after he had learned regularly to eat meat, his mental activity diminished, his eyes lost their brilliancy and expression, and his vivid propensity to constant activity was also diminished. The intense application of his mind gave way to absence and indifference; and the quickness of his apprehension was considerably impaired.”

The testimony which I have produced will be all-sufficient to convince the liberal and intelligent of the

prejudicial tendency of animal food, and the beneficial effects resulting from a vegetable diet. But if they still persist in the barbarous custom of countenancing the destruction of animals, without being able to prefer the argument of necessity, let them at least select those kinds of animal food which are the most wholesome, and which are cooked in the best manner.

Reason and experience emphatically exclaim, "eat no animal food;" but if it is used at all, let it be eaten as seldom as possible, avoiding high-seasoned meat, and abstaining from animal food during the warm months of summer. Dinner is the only meal at which it is at all admissible to eat flesh. Not more than one kind, however, at a meal, should be indulged in, and that either roasted, broiled, or boiled—boiling is the most proper method, rendering the meat less stimulating, although depriving it of a portion of its nutritive properties; but *frying*, a very common mode of cooking, is highly censurable, "the heat being applied through the medium of boiling oil, or fat, which is rendered empyreumatic, and liable to disagree with the stomach." Baked meats, by the retention of their oil, and its empyreumatic nature, are liable to produce the same effects. Meat should never be served with made gravies, nor with seasonings of any kind, unless it be a very small quantity of salt.

The flesh of young animals, such as veal, lamb, and young pork, should not be eaten. As a general rule, all substances, whether fruits, vegetables, or animals, are not so wholesome nor so digestible when young, as after they have arrived at maturity.

Beef is the most wholesome, and the most nourishing kind of animal food; it should be but slightly cooked.

Mutton is the most digestible of all flesh-meat, and is highly nutritious. Next to beef, it deserves a preference. The fat, however, should be avoided; it is more difficult of digestion than that of any other animal.

Pork is the most indigestible of animal aliments; from the great quantity of oil it contains, it is only by the robust, and those who take much exercise, that it can be safely used. Its too frequent and long-continued use

produces a gross habit of body, occasions foulness of the stomach and bowels, and frequent disorders of the skin. Salted, smoked, or dried, it is rendered still more unwholesome. The weakly and consumptive should abstain entirely from *ham*.

All species of game, as venison, rabbits, and hares, are very heating or stimulating, and not so well adapted to the stomach as the flesh of domestic animals.

Poultry is preferable to many kinds of animal food. The hen is probably the best, and approaches, in mildness, more nearly to vegetables. The turkey ranks next, but the accompanying stuffing should be avoided. Geese and ducks are injurious articles of diet; their fat, in particular, is extremely indigestible.

Fish are less nutritious than flesh, although not so stimulating. From their strong tendency to putrefaction, it is not safe to use them, except in moderate quantities. The jockeys who *waste themselves* at Newmarket, are fed almost wholly on fish. It is difficult of digestion, and the fat of fish is, perhaps, still more insoluble in the stomach than that of quadrupeds, and much disposed to turn rancid. Eels, from the quantity of oil they contain, seriously disturb the digestive powers.

All shell-fish should be avoided; they are extremely indigestible, particularly crabs and lobsters. Lobsters have been suspected, from their peculiar effects upon the stomach, skin, and throat, to contain some poisonous principle. We have, likewise, numerous instances recorded of death from eating muscles, also attributed to some poisonous qualities; but, it is more than probable, that their indigestible nature was the true cause. Oysters, whether cooked or otherwise, are very indigestible. When eaten, in the raw state, they are swallowed without chewing, imposing an additional duty upon the stomach while converting them into chyle. The quantity of mustard, pepper, salt, and vinegar, usually accompanying oysters, should condemn them as improper articles of diet; and they are likely to produce the bad effects attributed to other highly concentrated forms of



nourishment. By cooking there is a great change produced in their albuminous principle, increasing their indigestibility.

Eggs also contain much nutriment in a small space, a great objection, as will be shown hereafter, to any kind of food: when they are boiled *hard*, they are almost as indigestible as bullets.

Those who choose to eat animal food may make a judicious selection, from the various kinds, with considerable advantage to their bodily health. But, once more, I repeat my advice, and sincerely, too—eat no animal food, whether it be *fish, flesh, or fowl*.

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#### MILK.

MILK is a fluid secreted by peculiar glands, and designed to nourish animals in the early part of life. It is separated immediately from the blood in the udders, or the breasts of female animals. When milk is first drawn, it has the appearance of a white, opaque liquid, with a mild saccharine taste, and aromatic odor. After standing a short time, it commences to separate spontaneously into three distinct parts, *cream, curd, and whey*. The *cream*, when deprived of its impurities by churning, constitutes *butter*. The *curd*, when pressed, salted, and partly dried, is *cheese*.

It has been customary, from time immemorial, to speak loudly in praise of milk; some have called it the *wine of youth*; it has been eulogized in pastoral poetry, and prosaic writers have delighted to celebrate its virtues. Consecrated by time as the fountain of health, and hallowed by a thousand associations of rural simplicity and primæval innocence, it may appear temerity in me, to detract from its celebrity, or to question its utility: nevertheless, I am firmly convinced that it is by no means a wholesome article of diet.

Milk is the natural food of infants, until, by the growth of their teeth, they are enabled to masticate solid aliment. It was, perhaps, necessary that infants should thus be supplied with an aliment which contained much

nutriment in a small compass, and might be easily assimilated, while their digestive organs were imperfectly developed. The young of animals, if nourished by milk, always abandon it after a certain period; but mothers generally wean their children, either from motives of necessity, or to suit their own convenience.

It has been already observed that the *saliva*, or spittle, is necessary to a healthy digestion, and is always mixed with the food during the process of chewing. The infant, in the act of abstracting nourishment from its mother's breast, is forced to exercise its lips and tongue, in such a manner that the *saliva* flows into the stomach along with the milk. But when cow's milk is used as a drink, or eaten with bread, very little of the saliva, if any, is mixed with it. It is a common complaint with those who use it that it makes them *feverish*; and weakly persons cannot partake of it at all without boiling. It frequently produces acidity of the stomach and *costiveness*. This latter effect is the result of its concentrated form of nourishment.

It may be well, at this time, to protest against all *concentrated aliment*. Both vegetable and animal food contain a certain portion of matter which is called *nutritious*, that is to say, its elements are precisely similar to those which compose the body, and, consequently, are all converted into blood by the process of digestion. But the remaining portions, which cannot be assimilated, are evacuated from the bowels as excrementitious. Now, from a knowledge of this fact, an alarming error has extensively prevailed, viz. that, if the nutritious portions of food could be separated from the excrementitious, they would be far better adapted as articles of diet than the two portions combined. Hence arrow-root, tapioca, and sago, have been, lately, much employed as food for the sick, with what advantage medical practitioners have begun to perceive. The fact is, that all food requires a certain bulk, or, in other words, that an article of diet may be wholesome, it is necessary that it should contain, not only the nutritious particles of matter, but also those which cannot nourish the body. Sugar, honey,

starch, and molasses, are concentrated aliments. Sugar, for example, if pure, is composed of oxygen, carbon, and hydrogen; these three elements enter into the composition of the human body: consequently, an ounce of sugar, if digested in the stomach, would be entirely converted into *chyle*, leaving no residue to be evacuated from the bowels. Now we all know that if we eat a certain portion of sugar, the stomach appears cloyed, nausea ensues, and a strong propensity to vomit. This does not result from any thing intrinsically injurious in the sugar, but because sugar is the nutritious particles of matter separated from a vegetable, and thus presented to the stomach in a form highly obnoxious. It is owing to the same cause that all confectionary, all oils, and fat, are so exceedingly pernicious.

MAGENDIE concluded, from his experiments on animals, that they could not live on non-azotised substances, that is, on substances which contain no nitrogen. A dog, fed on sugar, rapidly emaciated, and died in a few days, his eyes being very severely affected. Another dog, fed on fine wheat bread, did not live beyond the fiftieth day; and a rabbit or guinea-pig, fed on the best wheat alone, die of starvation within a fortnight. An ass fed on rice boiled in water, does not survive above a fortnight.

MAGENDIE was evidently wrong in his conclusions: in the first place, he tried his experiments upon a dog, whose natural food is flesh. In the second place, he tried them upon a rabbit, whose natural food contains a very limited amount of nourishment. In the third place, he chose all the most concentrated articles of diet; his wheat was not in the condition that it grew, it had been deprived of its *bran*, or covering; and the sugar was procured by art, there being no such article in nature. Hence those who deprive their wheat of its bran, potatoes of their skin, or any fruit of its natural covering, are rendering such food more concentrated, besides depriving the articles of their natural stimulating qualities when applied to the alimentary canal. Had MAGENDIE selected such non-azotised substances as are

found growing naturally, he would have arrived at quite a different conclusion.

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CREAM.

“WHEN milk has been allowed to remain at rest, for a few hours, a thin layer is formed upon its surface, of a substance having a thicker consistence and apparently a more unctuous or fatty nature than the fluid upon which it swims. This is the *cream* which has separated spontaneously from the other parts of the milk, and, from its lightness, has risen to the surface. The separation of the cream is influenced by heat, and by exposure to the air.

“Cream is highly nutritious, but not a proper article of food. Taken in any quantity into a stomach, the digestive powers of which are slow and imperfect, it is apt to produce heart-burn, a sense of oppression, and other uneasy sensations.

“On its first separation, cream is not to be considered entirely pure; it still containing a portion of the other ingredients of the milk; when these are removed from it by agitation, or the process of churning, the oil appears in its proper form, constituting the well-known substance, *butter*.”\*

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BUTTER.

As an article of diet, butter is decidedly pernicious, even when fresh, and, if used at all, should be eaten very sparingly. When it has undergone that change which is termed *rancidity*, there cannot be a more injurious substance introduced as nourishment into the stomach. It was not used as food in ancient times.

“From many incontestible proofs (says DR. FOTHERGILL) that butter, in considerable quantities, is injurious, it is less used in many families. It is found, by many, to be very difficult of digestion, especially when *toasted* before the fire, or *fried*, as well as in *sauc*es.

\* Journal of Health.



Many people, apparently robust, and whose organs of digestion are strong, often find themselves much disordered by large quantities of butter. Nothing more speedily and effectually gives the sick head-ache, and, sometimes, within a very few hours. After breakfast, if much toast and butter have been used, it begins with a singular kind of glimmering in the sight; objects swiftly changing their apparent position, surrounded with luminous angles, like those of a fortification. Giddiness comes on, head-ache and sickness. These are circumstances that often happen to people who are inattentive to the quantity of butter they eat at breakfast."

"Whatever has a tendency to produce rancidity in butter (says the JOURNAL OF HEALTH) either by too long keeping, exposure to heat, or to the operations of cookery, as in frying, baking, or burning, renders it, in the same degree, injurious to the system. Nothing can be more detrimental to the stomach than *fried*, or *burnt* butter; it renders digestion difficult and painful, and causes various uneasy sensations, which last for many hours. What is termed sick head-ache, is particularly liable to be induced by butter rendered acrid in the process of cookery. Subsequently to a meal at which any substance fried in butter, or hot buttered toast has been made use of, the person often experiences a singular kind of dizziness of sight, objects swiftly changing their apparent position, and appearing surrounded with luminous points and angles. Giddiness succeeds, with head-ache and sickness. The same symptoms, or, at least, heart-burn, acrid eructations, sickness and oppression of stomach, are very liable to be produced by pastry, and various cakes, in the composition of which butter or any other species of fat enters: by persons who value health and comfortable feelings, such articles will never be eaten fresh."

"As a wholesome aliment (says DR. HALL) butter should be fresh, and free from rancidity, and not *fried* or *burnt*; otherwise, the acid being disengaged by age and fermentation, as well as by fire, it will disorder digestion, render it difficult and painful, excite acrid em-

pyreumatic belchings and introduce much acrimony into the blood."

"Butter (says DR. WHITLAW) is an article in very general use throughout the whole of Europe, and considered as a wholesome and nutritious substance; so much so, that few persons will admit it can be injurious to health, eaten in any quantity, or that its quality, however deteriorated, can give rise to severe disease. But experience has led me to form a very different estimate of its effects on the animal economy; and I am happy to find my opinions corroborated by the testimony of a very able physician."

In a Dictionary of Medicine, by DR. MACAULY, of Edinburgh, on the use of butter, he observes, that "when used as a sauce, or cooked or baked into paste, it is in this way that it is too often used to excess; and though it does not produce effects that are immediately apparent, it lays the foundation of stomach complaints of the greatest obstinacy. Its use is also apt to give rise to diseases of the skin very difficult to cure. Persons laboring under stomach complaints should not use much butter, especially when heated, as in buttered toast, muffins, &c.; and those subject to inflammatory and gouty affections, should be sparing of the use of butter in all its forms. It is a bad part of the management of children to pamper their palates by frequently indulging them with butter, as it is apt to give rise to a gross and unhealthy habit of body, characterised by the frequent appearances of boils and other sores, discharges from behind the ears, &c., or eruptions on the head, and other parts of the skin. Its inordinate use also occasions too great fullness of the system; and in the numerous nervous and inflammatory diseases of children, it is the high fed and plump children that are most frequently the severest sufferers."

"Butter (says DR. RICKESON) when used very *hot*, *fried*, or in the least *burnt*, is far from being wholesome; it is very oppressive and unfriendly to the stomach, not unfrequently impairing the faculty of digestion, and occasioning giddiness, head-ache, and sickness at the

stomach ; symptoms often, though erroneously, imputed to other causes."

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CHEESE.

"AFTER the separation of the cream, or oily part, from the milk, the remainder spontaneously coagulates into a soft, but somewhat consistent mass, in which the serous portion of the milk is still contained. Soon, however, the coagulum becomes acid, when a separation takes place between the curd and the whey.

"The curd is most generally obtained by artificial means. Notwithstanding its nutritive properties, especially when it contains a considerable quantity of the cream, it is nevertheless much more difficult of digestion than fresh milk. The principal form, however, in which curd is eaten, is when it has been deprived, by pressure, of nearly all the watery parts, and dried—constituting the well known substance, *cheese*. But it is seldom that the curd alone is made use of in the manufacture of cheese, hence the qualities of this latter differ according to the greater or less amount of cream which enters into its composition.

"Cheese made entirely from curd is extremely indigestible, and adapted only to the most robust stomachs. As a general rule, indeed, all kinds of cheese are difficult of solution in the stomach, and as an aliment, can, with propriety, be made use only by the healthy, the strong, and the laborious, especially those who are of temperate habits, and are engaged in active employments in the open air. We are now speaking of cheese in its recent state, or which has been prepared and preserved in such a manner as to undergo but little change. In general, however, cheese acquires, with age, new properties, becoming more stimulating and less nutritious. This arises from a spontaneous decomposition in it, by which a certain amount of ammonia and some other salts are developed. It is this which gives to it its peculiar sharpness, and, in some measure, its taste and smell. In such condition, cheese can, with safety,

be made use of only in very small quantities, as a condiment along with other food. The idea entertained by many that a portion of old cheese, taken with the dessert, aids digestion, is perfectly absurd.

“Certain epicures, and individuals of certain northern nations, prefer cheese which is advanced very nearly into a state of putrefaction. When in this state, there can be but one opinion with regard to its pernicious effects. Divested almost entirely of its nutritive properties, and disgusting at once to the taste and smell of all in whom these senses have not been completely vitiated, it should be banished by every person from his list of eatables; it is fit only for the use of those nations, wherever they may exist, whose habitual beverage, we are told by a sapient writer, is composed of train oil. Almost the same remarks may be made in regard to cheese replete with various insects.

“Cheese, though most commonly used in its raw state, is, by many persons, toasted, that is, heated over the fire, so that a portion of its oil is separated and fried, while the other parts acquire a tougher consistence. Though we will not say that cheese, thus prepared, is absolutely indigestible, yet it is so to a very great degree, while it is liable to produce painful sensations of the stomach, sick head-ache, acrid eructations, feverish heat of the skin, and disturbed sleep.”

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#### BUTTER-MILK.

BUTTER-MILK is well known as the watery sour milk separated from cream in the process of churning. If perfectly fresh, and procured from milk, the whole of which has been employed in churning, it constitutes a very cooling and refreshing drink. If drunk, however, in large quantities, it is apt to disorder the stomach.

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#### HONEY.

HONEY is a substance collected by bees from the nectaries of flowers. It is supposed to consist of sugar,



mucilage, and an acid. Its effects on some constitutions are very peculiar, producing an uneasy sensation in the stomach, flatulence, and disorders of the bowels. Like other concentrated forms of aliment, it is improperly used as food.

VEGETABLE FOOD.

“Happy the man, who, studying nature’s laws,  
Through known effects can trace the secret cause :  
He feeds on fruits, which, of their own accord,  
The willing ground and laden trees afford :  
Simple his beverage, homely is his food,  
The wholesome herbage and the running flood.”

THAT vegetable food is the most wholesome, and the best adapted to fulfil the requisitions of nourishment, has been already abundantly proved. In the present state of society, by far the largest share of vegetable food is derived from the farinaceous seeds or grain, such as wheat, rye, &c. To be used exclusively, they are too nutritious, and hence require to be accompanied with potatoes, and other vegetables which contain a less amount of nutriment in a given space. From analysis, by experienced chemists, it is found that 100 pounds of

		Nutritive matter.
Wheat,	contain	85 lbs.
Rice,	“	90 “
Rye,	“	80 “
Barley,	“	83 “
French beans,	“	92 “
Peas,	“	93 “
Lentils,	“	94 “
Broad kidney beans	“	89 “

It will be seen from the above table that a very large proportion of nutriment is contained in the vegetable *seeds*. The seeds are intended to afford nourishment to the young plants that grow from them, and, consequently, a considerable portion of nutritious matter was necessarily crowded in a small space. It will very readily occur to the mind that the exclusive use of such concentrated aliments would be very unfriendly to the digestive powers of the human stomach ; hence the no-

cessity of a due admixture of the farinaceous seeds and the less nourishing vegetable substances. By comparing the above table with the amount of nutritious matter contained in the *roots* and *leaves* of vegetables, we will perceive that the *seeds* contain nearly four times as much nutritious matter; 100 pounds of

		Nutritive matter.
Potatoes,	contain	25 lbs.
Beets,	"	14 "
Carrots,	"	10 "
Turnips,	"	4 "
Cabbage,	"	7 "
Greens,	"	6 "

Butcher's meat, averaging the various sorts, contains only 35lbs. of nutritious matter in a hundred. Those, therefore, who adopt the vegetable system, need not be apprehensive of *starvation*, since the majority of vegetable substances contain a larger amount of nutriment than animal food.

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#### SEEDS OF VEGETABLES—BREAD.

Of all the farinaceous *seeds*, the preference is justly given to *wheat*. When manufactured into bread, it has long received the appellation of the *staff of life*. So useful and necessary an article of diet is bread, that those nations which have no farinaceous seed, make something in imitation of, or as a substitute for it. Notwithstanding, however, that *wheat* contains so large a proportion of nutritious matter, the ingenuity of man has succeeded in divesting so minute a seed of its covering or *bran*, and grinding the remainder into a fine white flour. Of the injurious tendency of this mode of preparing flour, I shall speak hereafter.

When we consider that nature has furnished us with an alimentary canal, *six and thirty* feet in length, it must be obvious that it was designed to fulfil some other more important function than the mere change of food into *chyle*. The first *six* feet of the canal can accomplish that object, while the remaining *thirty* are appropriated to the removal of those particles of food from the body

which are incapable of affording nourishment. Hence nature never intended the stomach for the reception of highly concentrated food. Indeed, Nature seldom produces highly concentrated aliment; it is generally prepared by art. Had Nature intended that man should have removed the *bran* from *wheat*, or the *skin* from a *peach* or a *potato*, previous to mastication, would she not have provided him with an apparatus suitable to the performance of such a duty?

DR. DARWIN says, that the art of feeding mankind on so small a grain as wheat, appears to have been discovered, in Egypt, by the immortal Ceres. To the art of cultivation wheat is indebted for its nutritive properties. Farinaceous seeds are ground in a mill, and, after the *bran* has been removed, the residue is called *flour*. Flour is composed of *mucilaginous saccharine* matter, considerable *fecula* or *starch*, and an adhesive gray substance called *gluten*. The *mucilaginous saccharine* matter is composed of *gum* and *sugar*; and the *gluten* is a gluey substance, much resembling an animal substance which is the basis of the muscles and other solid parts. All vegetables are called *farinaceous* from which meal or flour can be obtained.

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#### WHEAT BREAD.

OF wheat bread, there are three varieties; in the first, *all* the *bran* is separated; in the second, only the *coarse*, and, in the third, *none at all*. The bread, made of flour from which *all* the *bran* has been separated, is that most commonly used, but bread, made of flour from which *none* of the *bran* has been separated, is the most wholesome. Bran operates as a stimulus to the intestinal canal, by increasing its peristaltic or worm-like motion, and, for this reason, always keeps the bowels open, thus obviating the tendency to costiveness produced by the use of bread made from superfine flour. The mucilage it contains, also soothes the bowels, preventing any irritation that might result from the particles or scales of bran. To those who adopt the vegetable regimen, it

would be well to say, that the neglect of the "Brown Bread," as an accompanying article at their meals, is a serious evil, and is, in fact, a breach of the fundamental principles upon which the system is founded.

"The flour of wheat (says DR. PARIS) contains three distinct substances; a mucilaginous saccharine matter, *starch*, and a peculiar substance, possessing many of the properties of animal matter, termed gluten. The tendency of *starch* upon the bowels is astringent. Bread, therefore, which is made of the whitest flour is apt to render them costive; but this is counteracted by the presence of *bran*, the scales of which appear to exert a mechanical action upon the intestines, and thus to excite them into action. I have already stated, that there are many bodies which have the power of thus acting upon the inner coats of the intestinal canal, and of increasing its peristaltic motion."

"Bread (says DR. MEASE) made from *unbolted* wheat-en flour is to be preferred to white bread."

"The ancients (says DR. SCOTT) considered that bread most wholesome and nourishing which was made of flour retaining the *whole* of the bran which is contained in the wheat. Hence the Greek wrestlers used no other bread than that made with coarse unsifted flour, and this they considered was so strengthening and nourishing, that they called a brown loaf *coliphium*, which imports strength of limb. It would be well then if those who suffered from irregularity of bowels made use of this kind of bread only."

"In the *bran* of the wheat (says DR. TRYON) is an oily quality, which is of a sweet, friendly nature. The bread made of this mixed with the flour, will not only be sweeter, and keep longer moist, but is easier of digestion—gently loosens the bowels, and, if plentifully eaten, will free the passage from gross phlegmy matter, and strengthen more than the fine bread."

"Of the two sorts of bread (says the ART OF LONG LIFE) viz. the fine white bread, and the coarse brown bread, the latter is the most easy of digestion and the most nutritive. This is contrary to the general belief



but is proved by the fact, that a dog fed on the former, with water, both at discretion, does not live beyond the fiftieth day ; but if fed on coarse bread with water, precisely in the same manner, he preserves his health. A rabbit or Guinea-pig, fed on the best wheat alone, dies, with all the symptoms of starvation, commonly within a fortnight, and sometimes sooner."

"If you set any value on health, and have a mind to preserve nature (says TRYON in his *Way to Health*, published in 1691) you must not separate the finest from the coarsest flour, because that which is fine is naturally of an obstructive quality ; but, on the contrary, the other, which is coarse, is of a cleansing and opening nature ; therefore that bread is best which is made of both together. It must be confessed that the nutritive quality is contained in the fine flour, yet, in the *branny* part, is contained the opening and digestive quality, and there is as great a necessity for the one as the other, for the support of health. By what has been said, we may gather that the eating of fine bread is inimical to health, and contrary both to nature and reason ; and was at first invented to gratify luxurious persons, who are ignorant both of themselves and of the true virtue and efficacy of natural things."

Of the two kinds of bread, the unleavened (a simple mixture of meal and water) is preferable, if prepared from the *unbolted* flour ; but that made with the fine white flour, such as crackers and pilot-bread, is always of a viscid indigestible nature, unless mixed with butter or lard to render it more friable and porous, in which case it is still more prejudicial. Bread should not be eaten until it is at least twelve hours old.

"The bread (says MR. GRAHAM) should not be eaten until at least twelve hours after it comes from the oven, and it is better at twenty-four hours old ; and if toasted, it should not be buttered before it is quite cold : and no warm cakes—buckwheat nor any other kind, should be brought upon the table at any time."

"New bread (says DR. TURNBULL) contains much indigestible paste ; and, its fixed air not being entirely

expelled, it becomes extracted in the stomach, and produces flatulence, cramp, and indigestion. This effect is easily prevented, either by keeping the bread till stale or toasting it."

"*Hot* bread (says DR. RICKESON) is not so healthy as cold, being more indigestible, and very apt to clog and oppress many people's stomachs: indeed, there have been instances of persons being thrown into violent colics, and of some who have been thought to have lost their lives, by eating hot bread, rolls, or *short-cakes*, with a large portion of stale or rancid butter. Stale bread is, also, thought to be more wholesome than that which is newly baked."

"Bread (says DR. PARIS) should never be eaten *new*; in such a state it swells, like a sponge, in the stomach, proving very indigestible. Care should also be taken to obtain bread that has been duly baked. Unless all its parts are intimately mixed, and the fixed air expelled, it will be apt, in very small quantities, to produce ascendency and indigestion."

"*New* baked bread (says DR. WILlich) always contains much of an indigestible paste; which is remedied, either by allowing it to dry for two or three days, or by toasting it. Stale bread, in every respect, deserves the preference; and persons troubled with flatulency, cramp of the stomach, and indigestion, should not, upon any account, eat *new* bread, and, still less, *hot rolls* and *butter*."

"Bread (says DR. MEASE) should be light, and none other must be touched. There is no excuse admissible for heavy bread. No wheaten bread should be eaten unless twenty-four hours old. Economy and health unite in proscribing fresh bread as an article of diet; for, however palatable, it is highly injurious to the stomach, and tries its powers more than almost any other of the causes of disease. During the years of youth, when the natural vigor of the stamina is daily deriving an accession of strength,—or, in constitutions enjoying greater powers of the stomach than are absolutely required for the purposes of digestion, fresh bread may be

eaten with impunity for years ; but I will venture to assert, that every meal, in which it is taken, will detract some little from the powers of that organ ; and that, in time, it will show its effects."

Besides bread, there are several other preparations in which flour is the chief ingredient, such as pudding, short-cake, pancake, &c. Some cakes are rendered brittle, or, as it is called, *short*, by an admixture of sugar, and fat, or butter, and of sugar and starch. When it is intended that the cake shall present an exceedingly spongy or porous appearance, white of gum, gum water, isinglass, and other adhesive substances are employed. But all such preparations are more or less injurious ; they are only intended to please the palate, while the stomach is the sufferer.

"The most digestible pudding (says DR. PARIS) is that made with bread and boiled ; flour or *batter* pudding is not so easily digested ; and *suet* pudding is to be considered as the most mischievous in the whole catalogue. *Pancake* is objectionable, on account of the process of frying imparting a greasiness to which the stomach is not often reconciled. All *pastry* is an abomination."

"Indeed (says DR. WILlich) all *pastry*, whatever, is unwholesome, especially when hot."

"All kinds of bread, rolls, and cakes, (says DR. RICKESON) containing much shortening, and the different kinds of unfermented pastry are very difficult of digestion ; and, if eaten hot, particularly offensive to certain constitutions."

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#### RICE.

RICE is very easily digested, but is seldom made into bread ; it is generally boiled or stewed. It probably nourishes a greater number of human beings, than all other grains put together, being the principal food of the inhabitants of the East, who use some condiment with it, such as curry powder and spice, to obviate its tendency to confine the bowels. On this latter account it should never form the only article eaten at a meal, but

should be taken in conjunction with potatoes, or some less nutritive food. It is, however, a very wholesome grain, when used in that way.

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RYE BREAD.

RYE, more than any other grain, is strongly disposed to ascendency ; hence it is liable to ferment in the stomach, and to produce purging, which people, on first using it commonly experience.

Bread made wholly of rye, on account of its disposition to ascendency, fermentation, and flatulency, is not proper, at any time, as an article of diet, for those afflicted with nervous or dyspeptic symptoms.

Rye is, at best, a dangerous article to be used in the manufacture of bread. It is liable to be diseased by a black, curved, morbid excrescence, like the spur of a fowl, commonly called *ergot* or *spurred rye*. This disease appears to be caused by an insect which penetrates the grain, feeds on its substance, and deposits a poison in its place.

“Bread which contains some of this poison, neither ferments nor bakes well, and is glutinous and nauseous. The bread, when eaten, produces intoxication, lassitude, a sense of something creeping on the skin, weakness of the joints, with convulsive movements occurring periodically. Of those so affected, some can only breathe in an upright posture, some become maniacal, others epileptic, or tabid, and some have a thirst not to be quenched ; livid eruptions and cutaneous ulcers are not uncommon. The disease continues from ten days to two or three months or longer.”

DR. WHITLAW, who was employed by the Legislature to ascertain the cause of the great mortality in New-York, in 1811 and 1812, remarks—“When ground down with the flour, or used in distillation, it proves a mortal poison, and, at times, has proved a pestilential scourge to Europe : it has been equally fatal in America, and is supposed to have been the chief cause of the plague in London. In 1811 and 1812, a great number



of lives were lost from the spurred rye being used as food, and liquor distilled from the rye. The great mortality was confined to New-York and Vermont. Upwards of *twenty thousand* victims fell a sacrifice to the ravages produced by that dreadful poison."

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## INDIAN CORN.

It is more than probable that the common maize or Indian corn, will, in a great measure, supersede the use of wheat. Being less nutritious, it is a better article of diet; the greatest evil, however, attending its use, is, that it is seldom eaten unless *warm*, and then with a large quantity of butter. If *unbolted* Indian meal be procured, let it be cooked either as cakes, or hominy, and eaten cold, and a more innocent, wholesome grain cannot be used. When cooked in the form of cakes, and eaten hot, with melted butter, it is apt to produce heartburn, acrid eructations, &c. and to aggravate bilious disorders. Owing to the comparatively small proportion of *gluten* which Indian meal contains, it cannot be made into bread unless combined with some other flour.

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## BUCKWHEAT.

THIS grain constitutes the principal food of the inhabitants of Russia, Germany, and Switzerland. In the winter season it is much used in the United States. It is somewhat liable to ascescent fermentation in the stomach, and is supposed to occasion itching and cutaneous eruptions. Eaten hot, in the form of griddle-cakes, and swimming in butter, few articles are more pernicious.

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## BARLEY AND OATS.

BARLEY is a very wholesome and easily digested grain. It is principally used to thicken soup; and a decoction of it is a favorite drink among the sick.

Oats are less nourishing, but more stimulating than wheat. In Scotland, and in some of the northern coun-

ties of England, oats form the chief bread of the inhabitants. Fifty years ago, they constituted the only bread-stuffs of a fourth part of the population of Great-Britain. They are a very wholesome grain.

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#### PEAS AND BEANS.

BOTH peas and beans, from the great amount of nutriment they contain, are only fit for strong stomachs; in persons of weakly habits, they are liable to fermentation. Peas require to be well chewed to assist in their digestion. They are farinaceous.

The young green bean is a useful auxiliary to the more concentrated forms of food; but when shelled, particularly if it be old, it is very heating, and should be used by none but those who take much exercise. In weak stomachs, beans are liable to produce flatulency, heartburn, and pain in the bowels.

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#### CHESNUTS, WALNUTS, &c.

CHESNUTS, it is thought, were the first species of nuts used by man. They are farinaceous, containing some sugar, and considerable nutriment. They are the best articles of the nut kind, if boiled. As a general rule, however, all the nut kind, including walnuts, almonds, filberts, hazel-nuts, &c. are difficult of digestion, not only from their hardness, but the quantity of oil they contain, which, by becoming rancid in the stomach, gives rise to the most distressing sensations, heartburn, acrid eructations, &c.

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#### SEED-VESSELS OF VEGETABLES—FRUITS.

OF the many delicious fruits which enrich our orchards, very few are natives of our climate. The great majority of them had their origin in Asia, but, by care and cultivation, man has succeeded in producing them in great perfection, in our colder regions. Of all the varieties of aliment, none are so grateful to the taste,

none so refreshing in their season, as *ripe* fruit. In the whole vegetable or animal kingdoms, what luxuries can compare with the luscious peach, or the juicy apple? They need no cookery to develope their peculiar sweets. At all times and at all seasons they are welcome, and it would be far better for mankind if they were more generally used as food at their *meals*; instead of which, though the stomach be filled to repletion at their stated periods of eating, they indulge most largely in the eating of fruit between meals, probably to allay the heat and thirst produced by their stimulating diet, which they are well calculated to effect from their mild subacid and juicy composition. They are particularly valuable to those who are habitually costive. Fruits should never be eaten unless *perfectly ripe*; and native fruits are, at all times, preferable to those of foreign growth. When fresh and ripe fruit disagrees with the stomach, it is evident that the body is not in a healthy condition. Those who are accustomed to drink fermented liquors are peculiarly liable to be affected by its use.

*Apples* are the most wholesome and the most valuable fruit that we possess. If they are very sour, they should be boiled, roasted, or baked, by which means much saccharine matter is developed. When ripe, they are easily digested, and afford a most agreeable repast. The common crab-tree is the parent of all the great variety of apples now cultivated.

*Pears* are more delicately flavored than apples, and are a very wholesome fruit. The juice of pears, when fermented, forms a liquor called *perry*.

The *Quince* is considerably too acid for eating, unless well cooked, and rendered sweeter by addition of sugar.

The *Peach* is a wholesome and delicious fruit, and never, if perfectly ripe, and in moderate quantities, disagrees with the stomach.

*Apricots*, when ripe, are easy of digestion, and are considered an agreeable and nutritious delicacy.

*Plums* are mildly laxative and nutritious; but, being generally sour, they are used as preserves. When dried, and imported, they are called *prunes*.

*Cherries* are rather more difficult to digest than the other fruits, and should be eaten in moderation, particular care being taken to masticate them properly.

The *Persimmon* is a well-known fruit of an astringent nature, which grows in great abundance in the southern and western states.

Of foreign fruits we have the orange, the lemon, the pine-apple, date, prune, cocoa-nut, &c. They are not as wholesome as our native fruits, being more particularly adapted to the warm climates in which they are produced.

The *Water-melon* is a very cooling and refreshing fruit in the summer-months; but, being of a watery nature, it very soon ferments in the stomach, and, if eaten in large quantities, is followed by diarrhœa, cholera, &c.

The *Musk-melon* is a very delicious fruit, but is obnoxious to some constitutions, bringing on spasms, colics, &c. For this reason, many people eat them with pepper, salt, and other spices.

The *Cucumber* belongs to the same class of fruits, and is decidedly one of the most pernicious and dangerous articles of diet in common use. It is eaten in a *green* and *unripe* state, which alone would constitute a serious objection to its use. It contains an acrid principle, which is very unfriendly to health; it is quite destitute of any nourishing qualities, and is scarcely soluble in the stomach: and yet, this unripe, watery, indigestible production is esteemed a luxury. All who value health and comfortable feelings will find it to their advantage to avoid the cucumber.

*Pumpions* are a well-known, innocent, and wholesome fruit, in great favor with Americans, constituting one of the best vegetables for making pies.

Of *strawberries*, *gooseberries*, *raspberries*, *blackberries*, *grapes*, &c. it is unnecessary to say much; they are all more or less cooling and aperient, and, if ripe, are perfectly innocent and wholesome.

Dried fruits, such as *raisins* and *figs*, from the great quantities of saccharine matter which they contain, should be used moderately. Dried apples and peaches,



stewed with sugar, are agreeable and wholesome additions to the table.

Whatever fruit is eaten uncooked, should be *sound, fresh, and ripe.*

#### VEGETABLE ROOTS.

**THE *Potato*** is a farinaceous root, and one of the most invaluable vegetables in our possession. It is a native of Peru, and was first brought into Europe, by Sir Francis Drake, in 1486. Its introduction, as an article of food, “received, for more than two centuries, an unexampled opposition from vulgar prejudice, which all the philosophy of the age was unable to dissipate, until Louis XV. of France, wore a bunch of the flowers of the potato in the midst of his court on a day of festivity; the people, then, for the first time, obsequiously acknowledged its usefulness, and its cultivation, as an article of food, soon became universal.” It is, at present, held in high estimation all over Europe, and in this country. It is the principal food of the Irish peasantry and of the Lazzaroni of Naples. Without any addition but salt, it affords a most agreeable repast, and is the best substitute for bread. It has not the disadvantage of being too nutritious, and, if properly cooked, is easily digested. The proper mode of cooking potatoes is but little understood by the majority of people: they should be boiled, without paring their skins, until they are thoroughly cooked; the water must then be poured off, and the potatoes again set over the fire, a sufficient length of time to dry them: they should neither be deprived of their skins nor *mashed*—in either case they are more difficult of digestion. The young potato is not so digestible as the old, and should be avoided.

The *Sweet Potato* is more nutritious, and perhaps, as wholesome a vegetable as the common potato.

*Beets* contain much of the saccharine principle; they are easy of digestion and very nutritious.

*Carrots* are not easily digested, and often disagree with weak stomachs, and those of a bilious habit.

*Parsnips* are sweet and nutritious, and in high esteem as articles of food.

*Turnips* are mildly laxative, softening, and cleansing, and, on the whole, are accounted salubrious. If not well cooked, however, they are apt to prove flatulent.

*Onions* are acrid and stimulating, and possess very little nutriment. DR. CULLEN says, that they generally produce flatulency, thirst, head-ache, and febrile symptoms, in those of bilious constitutions. They communicate a very disagreeable fetor to the breath.

*Garlick* is nearly allied to the onion in its general qualities. This root has a pungent acrimonious taste, and a peculiarly offensive strong smell. The odor of this root is very diffusive; so much so, that the urine, perspiration, milk, &c. of those who eat it are strongly impregnated with its volatile particles. As an article of diet, it is still more prejudicial than the onion.

The *Radish* is an extremely pungent root, not very nutritious, and difficult of digestion. If eaten at all, it should be eaten with salt to correct its bad properties.

The *Horse-Radish* is a powerful and acrid stimulant. the odor of which is highly volatile and pungent. It is only used as a condiment, but, in the smallest quantities, it is prejudicial.

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#### VEGETABLE LEAVES.

*Cabbage* is a vegetable very difficult to digest, containing an inferior amount of nutriment, and so much disposed to fermentation, that even a moderate quantity will produce flatulencies in persons of sedentary habits.

*Lettuce* is a garden vegetable containing very little nourishment, and has been supposed to contain a principle somewhat resembling that obtained from opium; it is soporific, and has been recommended to those who pass sleepless nights.

*Spinach* and *Sorrel* are much used as greens. They serve, in some measure, to correct the bad effects resulting from a too full diet of animal food during the summer months.

*Celery, Parsley, and Water Cresses*, are gently aperient and carminative; as such they may be useful to correct the bad properties of flatulent vegetables.

*Asparagus* is esteemed a luxury in many parts, but it contains very little nutriment; all vegetables, however, of that description may be judiciously combined with those containing much nutriment in a small space.

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#### SOUP.

ALL decoctions of animal food, composed, as they mostly are, of very heterogeneous substances, are far from being healthy articles of diet. Watery food, in general, is difficult of digestion, and the nourishment derived from soups, is performed with much labor to the stomach.

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#### TEA.

THE tea-tree is a *narcotic* plant, produced in great abundance in China and Japan. The leaves are gathered at different seasons of the year; and hence it has been supposed that the varieties of Tea called *green* are gathered before the leaves are fully ripe, and the *black* when they are matured. However this may be, it is certain that *green* tea is much more injurious in its effects than *black*.

Tea is a luxury of modern times. It was first introduced into Europe by the Dutch, in the year 1610. It was imported from Holland into England, in 1666, by the lords Arlington and Ossory; soon after which their ladies brought it into fashion among people of distinction. At that time it sold in London for *thirteen* dollars per pound, although it only cost eighty-eight cents at Batavia. It maintained that enormous price, with very little variation, for nearly fifty years longer: black bohea was the only tea then used. Toward the year 1715 green tea came into pretty general use, and in the year 1776 nearly 6,000,000 of pounds were consumed in Great Britain. They now consume 23,000,000 annually.

The late **DR. CULLEN** has experimented upon its narcotic qualities, pronouncing it deleterious as an article of diet; adducing, in proof, that the increase of nervous diseases, according to the bills of mortality, has corresponded annually, throughout Europe, with the increased consumption of tea. Other physicians have maintained the same opinion, while others have been loud in its praise. It has only been in use among the common people during the last fifty or sixty years.

Tea is a stimulating, narcotic, astringent, and aromatic infusion; its activity depends upon its fragrant volatile principle. It increases and aggravates all nervous disorders; it produces palsies, tremors, dropsies, and a host of other diseases, which are making rapid strides toward reducing our population into a fretful, peevish, and hypochondriacal class of people.

“It is difficult (says **DR. RICKESON**) to account for so general use of an article brought so far, unless it be imputed to a predilection for foreign things, and to mere custom or fashion; for, it will be admitted, that tea possesses no very nutritious qualities, nor any very agreeable taste, more than may be ascribed to its constant and habitual use; it being now established upon undoubted authority, that all the different kinds are the produce of one and the same plant; and that the difference depends only on the soil, time of gathering, and method of preparing it.

“It is supposed that tea contains a volatile, cordial, or reviving principle; which, if admitted, is nothing in favor of its wholesomeness for common use; for powers of a stimulant nature, when long continued, are sure to be followed by an atonic or debilitated state of the stomach; and, finally, of the whole constitution.”

“Tea, (says **DR. PERCIVAL**) when received into the stomach, is highly debilitating and relaxing, and the immoderate use of it is attended with the most pernicious effects. It is curious to observe the revolution which hath taken place, within this century, in the constitutions of the people of Europe. Inflammatory diseases more rarely occur; and, in general, are much less rapid and



violent in their progress, than formerly. This advantageous change, however, is more than counterbalanced by the introduction of a numerous class of nervous ailments, in a great measure unknown to our ancestors; but, which now prevail universally, and are complicated with almost every other distemper. The bodies of men are enfeebled and enervated; and it is not uncommon to observe very high degrees of irritability, under the external appearance of great strength and robustness. The hypochondria, palsies, cachexies, dropsies, and all those diseases which arise from laxity and debility, are, in our days, endemic every where; and the hysterics, which used to be peculiar to the women, as the name itself indicates, now attacks both sexes indiscriminately. It is evident that so great a revolution could not be effected without the concurrence of many causes; but, among these, I apprehend, the present general use of tea, holds the first and principal rank. The second place may, perhaps, be allotted to excess in spirituous liquors. This pernicious custom, in many instances at least, owes its rise to the former; which, by the lowness and depression of spirits it occasions, renders it almost necessary to have recourse to what is cordial and exhilarating. And hence, proceed those odious and disgraceful habits of intemperance, with which too many of the softer sex, are now, alas! chargeable.

“Green tea is much more sedative and relaxing than bohea; and the finer the species of tea the more debilitating and pernicious are its effects, as I have observed in others, and experienced in myself.”

“A moderate use (says DR. WILlich) of fermented or distilled spirituous liquors, is far less prejudicial to the constitution, than the habitual and excessive drinking of warm liquors. Tea, the common favorite among all ranks, if taken regularly twice a-day, and in large quantities, is attended with bad consequences. It thoroughly relaxes the coats of the stomach, weakens the bowels, predisposes them to flatulency, upon the least occasion, and destroys all the energy of the digestive organ. The relaxation which tea occasions in the first passages, ren-

ders it peculiarly hurtful to females of lax fibres, a thin blood, and irritable habits. To enumerate the great diversity of nervous symptoms, attending its abuse, in such constitutions, would lead me too far from the prescribed limits; but so much is certain, that the vapors arising from liquors, drunk very hot, like tea, weaken the lungs, and dispose their votaries to frequent colds and catarrhs, which readily make a transition into consumptions. Hypochondriac and hysteric people, however, are much deceived in the efficacy of tea, as a diluent drink; for all the evils arising from relaxation, a weak stomach, and flatulency, under which such persons usually labor, are, by the habit of drinking tea, increased to a most alarming degree. The cold stomach, which they propose to warm by it, is a mere phantom of the brain; for this sensation of cold is nothing but relaxation, which, instead of being removed by hot liquors, is increased by every repetition of them.

“It would be a great proof of patriotic spirit, in this country, if the use of this exotic drug were either altogether abandoned, or, at least, supplied by some indigenous plants of equal flavor and superior salubrity. It would, undoubtedly, be more conducive to our health, if we would altogether dispense with the use of warm liquors, at least when in a healthy state.”

“All nervous disorders (says DR. LEAKE) are aggravated by the use of tea: and it is equally unfit for children, and those of lax fibres, especially the first, whose fluids bear a much larger proportion to the solids of the body than in adults.”

“Tea (says DR. BUCHAN) will induce a total change of constitution in the people of this country. Indeed, it has gone a great way toward effecting that evil already. A debility, and consequent irritability of fibre, are become so common, that not only women, but even men are affected with them. That class of diseases, which, for want of a better name, we call nervous, has made almost a complete conquest of the one sex, and is making hasty strides toward vanquishing the other. Did women know the train of diseases induced by debility, and how

disagreeable those diseases render them to the other sex, they would shun tea as the most deadly poison."

"Avoid (says DR. WILlich) the excessive use of hot drinks, such as coffee, chocolate, and tea, particularly the last, in which the inhabitants of this country indulge more than in any other beverage. I scarcely dare venture to impeach this favorite solace of our morning and evening hours; but, with all due deference to the happiness of the domestic circle, I consider it my duty to denounce the too liberal use of this liquor as not a little prejudicial to the fairness and purity of the skin. Tea, taken hot, and in immoderate quantities, not only has a tendency to weaken the organs of digestion, but causes fluctuations and congestions in the humors of the face, and frequently brings on a degree of debilitating perspiration. If the tea be made too weak, it will operate merely as warm water, and, as such, relax the coat and membranes of the stomach; if made too strong, it will give an unnatural heat to the body, prove a dangerous stimulus to the nerves, occasion palpitations of the heart, a general tremor, cramps, and a number of other complaints, which it is needless to enumerate. That these effects do not take place during the first months or years of indulging ourselves in the intemperate use of strong hot tea, is no argument to controvert the position; they will, either sooner or later, unavoidably follow."

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#### COFFEE.

Nothing certain is known with regard to the first use of coffee. It is said that an Arabian goat-herd first observed that his kids appeared extremely lively after browsing under the tree, so much so, that they were wakeful and capering all the night after. He mentioned this circumstance to the prior of a neighboring monastery; the prior deemed it a lucky opportunity to try its effects upon the monks, who were all apt to be nodding at their morning prayers. It was next resorted to by some Mahomedan dervishes, to keep them awake all night while at their devotions. From Mecca, it found



its way into Cairo. Thevenot, the French traveller, imported it from Persia into France. The Greek servant of an English Turkey merchant, introduced it into England, where he opened a house for the sale of it. The coffee-plant is a native of Arabia Felix.

Coffee is an astringent, stimulating, narcotic, and aromatic beverage. The berry possesses a peculiar bitter principle; but the nature of its fragrant volatile properties, developed by roasting, has not been ascertained. Strong coffee produces sleeplessness, acidity of the stomach, dyspepsy, tremors, and paralytic affections, disordering the skin, and causing troublesome eruptions. SLARE affirms that he became paralytic by the too liberal use of coffee, and that his disorder was removed by abstinence from that liquor. CELSIUS, the celebrated Swedish astronomer and natural philosopher, destroyed himself by the excessive use of coffee. VOLTAIRE became nervous, and reduced himself to a mere skeleton by this indulgence. It was formerly found that tea was the principal agent in producing nervous disorders, but since strong coffee has partially superseded the use of tea, universal complaints are brought against this new enemy and destroyer of health and life.

“It is rare (says DR. RICKESON) to see great and constant drinkers of strong tea and coffee, somewhat advanced in life, who have not some symptoms of weakness, tremors, or indigestion: wherefore, it is judged, that the great number and increase of paralytic, nervous, and hypochondriac disorders, are, in part, to be attributed to the frequent and excessive use of those articles, drunk in a hot and strong state.

“In delicate habits (says DR. PERCIVAL) coffee often occasions watchfulness, tremors, and many of those complaints which are denominated nervous. It has even been suspected of producing palsies; and, from my own observation, I should apprehend not entirely without foundation.”

“If drunk too strong (says DR. WILlich) it affects the nerves; and, by its penetrating property, often occasions tremors of the hands and sleeplessness; but, in



some phlegmatic and indolent individuals, it is apt to excite sleep.

“An immoderate use, however, of this decoction, is prejudicial to the healthy, and destructive to the diseased. It debilitates the latter still more by causing great undulations in the blood, tremor of the limbs, giddiness, and a certain insupportable timidity. It leads people of a sanguine temperament, and particularly females, to the long train of fashionable nervous diseases.”

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#### CHOCOLATE.

CHOCOLATE is a kind of cake, or hard paste, composed of the ground pulp of the cacao nut, vanilla, flour, eggs, and annatto, a dying drug of South America. Mixed with water, these ingredients are formed into a paste, and, while hot, are put into tin moulds, and soon congeal. As a drink, chocolate cannot be recommended; its nutriment is too concentrated, and it contains an oil difficult of assimilation. The cacao-nut makes a preferable infusion, but still, there is no drink so valuable as pure, soft water.

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#### FERMENTED LIQUORS.

No greater curse could have been inflicted upon society than the introduction of fermented and distilled liquors. The substitution of these beverages for pure water, is a most deplorable evil to mankind; and our daily conviction of its tendency should urge us to be unremitting in our efforts to check the wide-spread and overwhelming progress of intemperate habits.

The misery and crime which have sprung from this source alone, is without example. Murders, robberies, and criminal indulgences, naturally result. Poverty has increased with fearful rapidity; and none but the sufferers themselves can realize the loathsome horrors of a drunkard's home. Not one solitary benefit springs from the use of fermented or distilled liquors. How many evils flow from it, let our criminal calendars, our

poor-house records, and our physicians' diaries, exhibit to the world.

In the present volume, I have not space enough to exhibit the baneful effects of these liquors to the extent that they should be depicted. Were all the facts detailed that are known at present, every rational man would shun the social glass with horror, if not to preserve his own health, at least to discountenance a practice which is the parent of so much vice and wretchedness. Rather than swell the volume into a larger size than first proposed, I must remain contented with a simple outline of the present section.

Under the head of fermented liquors, I shall treat of **WINE**. Fermented liquors and distilled liquors are considered under different heads, because Wines are the simple product of fermentation, whereas distilled liquors, or ardent spirits, are Wines divested of their saccharine and mucilaginous properties.

Chemists give the name of Wine to all liquors that contain alcohol as the result of fermentation. Thus, beer, cider, mead, &c. are Wines.

Alcohol, it is well known, is the intoxicating ingredient of all liquors, whether vinous or spirituous. The relative strength, or power to produce drunkenness, depends upon the quantity of alcohol which a liquor contains. Wine may be procured from all vegetables that contain *sugar* ready formed, as the sap of trees, the juices of plants, and all ripe succulent fruits. The strongest Wines are obtained from the juice of grapes. When newly expressed, and before it has begun to ferment, this juice is called *must*; it will not then produce intoxication: but it contains a very large quantity of sugar, which undergoes decomposition, and two new compounds are formed, one of which is *alcohol*, and the other *carbonic acid*. Sugar is composed of *carbon*, *oxygen*, and *hydrogen*; 45 parts of sugar are capable of furnishing 23 parts of alcohol and 22 parts of carbonic acid. During fermentation, the sugar is decomposed: that is, its elements, *carbon*, *oxygen*, and *hydrogen*, separate from each other. A portion of the *carbon* and *oxygen*

unite, forming *carbonic acid*; while the remainder of the *carbon* and *oxygen*, together with the whole of the *hydrogen*, unite with each other and form *alcohol*. The juice of the grapes, however, contains other ingredients besides sugar, such as tannin, or the astringent principle, together with various salts and acids. These, and the alcohol, constitute **WINE**. When these ingredients are removed from the Wine, by distillation, we have ardent spirits. Every hundred gallons of ardent spirits is composed of 53 gallons of alcohol, and 47 gallons of water. And a hundred gallons of *pure* Madeira wine, contains 22 gallons of alcohol, and 78 of mucilage, acids, water, &c. but, most generally, a larger quantity of alcohol is added to the wine, to preserve it from spoiling. Here we see that the difference between ardent spirits and wines is owing to the larger quantity of alcohol which one of them contains. A single ounce of pure alcohol will extinguish life instantaneously; how injurious must those articles be, which contain so large a proportion of it, when daily used.

The strongest wines, such as Lissa, Madeira, and Port, contain from 20 to 25 gallons of pure alcohol in every hundred gallons of the wine. Cider, 8 gallons, and Beer, 6 gallons. In the same proportion that they contain alcohol are they to be avoided.

“Wine and other intoxicating liquors, when used in small quantities, quicken the action of the heart and arteries; but in proportion as this state is more or less frequently induced, do we sooner or later exhaust the vital powers. The best medical writers testify that the moderate use of fermented liquors is not only unnecessary, but is decidedly injurious to persons in health; and the degree of injury inflicted on the constitution is proportioned to the strength of the liquor and the frequency of its use.”

“Wine (says **DR. RICKESON**) is a powerful stimulant, the long continued use of which rarely fails to induce debility. Hence great wine-drinkers, somewhat advanced in life, are generally low spirited, and often afflicted with a long train of hypochondriacal symptoms,

and incurable diseases, particularly the gout. Those who indulge in wine and strong liquors, are, also, often afflicted with that painful and excruciating disorder, the gravel, which rarely yields to the power of any medicine hitherto discovered."

"Though spirit (says Dr. CARRICK) is the most pernicious liquor, being the strongest and most concentrated poison, all other strong liquors,—wine, beer, cider, &c. are injurious in proportion to their strength or the quantity of alcohol they contain. Madeira, Sherry, and Port, contain nearly half their bulk of brandy. The man who drinks his bottle of wine, drinks a pint of brandy in it; and the lady who takes two or three glasses of wine at dinner, swallows half a glass of brandy in each of them. There are whole nations where fermented liquors are unknown or not used; yet, in those countries, there are laborious occupations, and strong and healthy people—an irresistible proof that such liquors are not necessary for man."

"The copious use of wine, (says Dr. WILlich) though not to the degree of inebriation, is yet exceedingly debilitating to the stomach, as it checks digestion, and excites diarrhœa, if white wine, and obstructions, if port wine be the favorite liquor: it makes the fibres dry and rigid, and the cheeks and the whole surface of the body turn sallow—a symptom of bad digestion: the powers of the body and mind are enfeebled, and dropsy or gout, or sudden death, are the consequences."

"If the diseases (says Dr. BELL) produced by excess in wine drinking, be less violent and acute than those from ardent spirit, they are in greater number, and more complicated in the first than the latter case. The ardent spirit drunkard, if he survive the first shocks given to his constitution, may sometimes, though rarely, attain to an old age, in the tolerable enjoyment of his faculties. The tippler in wine subjects himself to such a complexity of diseases, that he sinks under them, in the shape of gout, dropsy, or inflammation of the brain: or if he survive for any number of years, his life may be called a long disease—gout, or rheumatism, or gravel."



"The idea (says DR. GARNET) that wine and other spirituous liquors assist digestion is false. Those who are acquainted with Chemistry know that food is hardened and rendered less digestible by this means."

"The lesser quantity of fermented liquors (says DR. FOTHERGILL) we accustom ourselves to, the better. People cannot be too cautious to shun the first glass."

"Vinous liquor (says DR. BEDDOES) acts as a two-edged sword. By its first operation it promotes indigestion; its second depends upon the change into vinegar which wine, however genuine, always undergoes in the stomach."

"It is often proposed (says DR. HARRIS) to substitute for ardent spirits, either vinous or malt liquors, as being less injurious. It should be recollected, however, that alcohol is contained in, and is the principle of, all intoxicating drinks."

"When a man (says DR. DARWIN) who has not been accustomed to strong liquors, drinks a quart of wine or ale, he loses the use of his limbs and understanding; he becomes a temporary idiot; and though he slowly recovers, is it not reasonable to conclude that the perpetual repetition of so powerful a poison must at length permanently affect him?"

"Fermented liquors (says DR. HALL) keep up a constant fever, which exhausts the spirits, heats and inflames the blood, disposes to numberless diseases, and occasions a premature old age. Liquors that are adulterated with a mixture of ingredients of the opiate kind, which are poisonous in their quality, hurt the nerves, relax and weaken the stomach, and, in a short time, spoil its digestive powers."

"Many of the habits of civilized society (says DR. ARMSTRONG) at once tend to produce chronic diseases of the arterial system; but, among the most common causes of these diseases, may be enumerated the use of *ardent spirits* among the lower classes, and of *wine and rich diets* among the higher."

"Wine (says an eminent author) raises the imagination, but depresses the judgment. He that resigns his

reason is guilty of every thing he is liable to in the absence of it. A drunken man is the greatest monster in human nature, and the most despicable character in human society; this vice has very fatal effects on the mind, the body, and the fortune of the person who is devoted to it: as to the mind, it discovers every flaw in it; it adds fury to the passions, and force to the objects that are apt to inflame them. Wine often turns the good-natured man into an idiot, and the choleric man into an assassin; it gives bitterness to resentment, makes vanity insupportable, and displays every little spot of the soul in its utmost deformity."

DR. HALLER abstained from wine from an early period of his life; his only beverage was water; and he delighted to represent the unfitness of the climate of Berne for the culture of the grape, as a signal advantage conferred by nature on his country.

"From the time at which DR. DARWIN first came to Litchfield, he avowed a conviction of the *pernicious effects of all vinous fluid* on the youthful and healthy constitution; an absolute horror of spirits of all sorts, and however diluted."

"One of the first indications of mischief (says DR. BEDDOES) from wine taken habitually in moderate quantity, when it may be supposed to act as a restorative, is a sense of dissatisfaction and being ill at ease experienced some hours afterwards. The young and sparing votary of Bacchus cannot be expected to present the bloated form and scarlet countenance; or to tremble all over on first rising, and exhibit to every spectator, in a lack-lustre eye and cheerless morning visage, the effects of his evening's libations. But what the veteran drinker is unable to conceal, the other will be sensible of in a proportionate degree. He will probably awake hot, restless, and heavy. The early sun will seem an intruder. He will shake off his drowsiness reluctantly, dress with langour, and be indifferent about food. The mouth will feel clammy, and the stomach uneasy until revived by a morning dram, or the stimulant operation of warm tea or coffee. After stretching and yawning till the limbs

are properly awake, he will eagerly close with any scheme which promises to raise emotions, or to relieve that listlessness which dinner and the circulation of the glass are required completely to dissipate."

*Beer*, according to HERODOTUS, was invented by the Egyptians. TACITUS mentions that it was in use among the Germans, in ancient times; and MOSES, also, speaks of inebriating liquors, drunk by the Hebrews, which it is supposed were *beer*.

Beer is made from malt and hops. Barley, or some other grain, is steeped for two or three days in water; the water is then drained off, and the barley spread upon the floor about two feet thick, where a spontaneous heat is generated, and the barley begins to grow, by shooting out its roots. The process of germination is then stopped, by spreading the grain thinner, and, by the subsequent operations, it is converted into *malt*. The malt is then ground in a mill, and subjected to a process called *mashing*, and a liquor procured which is termed *sweet wort*. This liquor is boiled with hops, and then cooled in shallow vessels, where it is suffered to ferment: the fermented liquor is *beer*.

There are few liquors manufactured which are subject to worse adulterations than beer. The pernicious effects of such beer must be very manifest, when we consider that most of the adulterating ingredients are poisonous substances. Quassia, wormwood, cocculus indicus, hartshorn shavings, Spanish juice, orange powder, ginger, grains of paradise, opium, liquorice, henbane, cherry laurel, copperas, capsicum, and mixed drugs, are some of the substances seized from the London brewers, as appears from the records of the House of Commons. Sulphate of iron, alum, salt, and extract of gentian root, are added, by some of the publicans, to give a frothy appearance to beer when poured from one vessel to another; this is called *beer heading*. Sulphuric acid is often added, to give new beer a taste resembling that which is 18 months old. Various other articles, such as capsicum, coriander seed, ginger root, and orange peel, are frequently employed to give pungency and



flavor to bad beer. Mr. ACCUM says, that the present *entire* beer of the London brewer is composed of all the waste and spoiled beer of the publicans, the bottoms of butts, the leavings of the pots, the drippings of the machines for drawing the beer, the remnants of beer that lay in the leaden pipes of the brewery, with a portion of brown stout, bottling beer, and mild beer. He says that opium, tobacco, nux vomica, and extract of poppies, have been likewise used to adulterate beer.

Beer contains about 7 per cent. of alcohol, when unadulterated. It possesses narcotic properties, which are, most probably, imparted by the hops. Many medical writers have spoken loudly against its use, some of which testimony deserves consideration.

“Malt liquors, (says DR. MACNISH) under which title we include all kinds of porter and ales, produce the worst species of drunkenness, as, in addition to the intoxicating principle, some noxious ingredients are usually added, for the purpose of preserving them, and giving them their bitter. The hop of these fluids is highly narcotic, and brewers often add other substances to heighten its effects, such as hyoscyamus (or henbane,) opium, belladonna (or deadly nightshade) cocculus Indicus (a poisonous Indian berry,) lauro cerasus (cherry laurel,) &c. Malt liquors, therefore, act in two ways upon the body, partly by the alcohol they contain, and partly by the narcotic principle. In addition to this, the fermentation which they undergo is much less perfect than that of spirits or wine. After being swallowed, this process is carried on in the stomach, by which fixed air is copiously liberated, and the digestion of delicate stomachs materially impaired.

“Persons addicted to malt liquors increase enormously in bulk. They become loaded with fat: their chin gets double or triple, the eye prominent, and the whole face bloated and stupid. Their circulation is clogged, while their pulse feels like a cord, and is full and laboring, but not quick. During sleep the breathing is stertorous. Every thing indicates an excess of blood. The blood, in such cases, is more dark and sily than in



the others. In seven cases out of ten, malt liquor drunkards die of apoplexy or palsy. If they escape this hazard, swelled liver or dropsy carries them off.

“The effects of malt liquors on the body, if not so immediately rapid as those of ardent spirits, are more stupifying, more lasting, and less easily removed. The last are particularly prone to produce levity and mirth, but the first have a stunning influence upon the brain. and, in a short time, render dull and sluggish the gayest disposition. They also produce sickness and vomiting more readily than either spirits or wine.”

“Malt liquors (says DR. BUCHAN) render the blood sizy and unfit for circulation: hence proceed obstructions and inflammation of the lungs. There are few great beer-drinkers who are not phtisical—brought on by the glutinous and indigestible nature of strong ale. Those who drink ardent spirits, or wine, run still greater hazard: these liquors inflame the blood, and tear the tender vessels of the lungs to pieces.”

“Strong beer (says DR. BEECHER) has no power to allay intemperate habits: it will finish what ardent spirits has begun, with this difference—that it does not rasp the organs with quite so keen a file, and enables the victims to come down to the grave with more of the good-natured stupidity of the idiot, and less of the demoniac phrenzy of the madman. Wine has been prescribed as a means of decoying the intemperate from the ways of death, but habit cannot thus be cheated out of its dominion.”

“A very considerable proportion (says DR. JOHNSON) of the middling and higher ranks of society, as well as the lower classes, commit serious depredations on their constitutions, when they believe themselves sober citizens, and totally abhor debauch. This is by drinking ale, or other malt liquors, to a degree far short of intoxication, indeed, yet, from long habit, producing a train of effects that embitter the ulterior periods of existence. Corpulency, obesity, hebetude, vertigo, apoplexy, and other affections of the head, are known to result from the abundant use of malt liquors; but it is

not generally suspected that they have a peculiar tendency, independently of the adulterations which too often enter into their composition, to produce effusions of water in the cavities of the chest, and to predispose to those numerous organic affections of the heart itself, which, of late years, have forced themselves on our attention beyond any thing known in former periods.

“Malt liquors assuredly give a greater degree of fullness to the blood-vessels than any other species of drink, while, in common with the latter, they paralyze the absorbent system, and render torpid many of the salutary secretions. The heart is thus called upon for unusual exertions, which eventually injure its function or structure; while the equilibrium between exhalation and absorption on the serous membrane of the chest is deranged, and dropsical effusions in the pericardium or bags of the pleura, ensue.

“The beer-bibber, then, has probably little reason to exult over the dram-drinker. If he escapes ascites, (dropsy of the abdomen) he runs the risk of hydrothorax (water of the chest), a much worse disease! If he have an immunity from disorders of the *liver*, he becomes predisposed to derangements of the *heart*! If he experience not emaciation and tremors, he too often becomes overloaded with fat, and dies apoplectic! If he be not so liable to maniacal paroxysms of fury, from the fire of ardent spirits, his intellectual faculties become sodden, as it were, and stupidity ensues.”

Cider, and other fermented liquors, modified by the various salts and acids which enter into their composition, are deleterious in proportion to the quantity of alcohol which they contain. Soda water and other drinks, whose pungency is owing to carbonic acid, are decidedly injurious, inasmuch as fixed air is not, under any circumstances, friendly to the stomach.

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#### DISTILLED LIQUORS.

WINES are converted into ardent spirits by the process of distillation; that is to say, that various ingre-

dients are removed from fermented liquors, leaving the alcohol in a more concentrated form.

Among the most powerful class of stimulants and poisons, ardent spirits claim a conspicuous station. They are not introduced into the stomach as capable of affording nourishment, but merely to rouse into temporary action; an action, invariably succeeded by a corresponding debility. Ardent spirits derange every portion of the living tissues, first exciting them to increased action, and, subsequently, inducing a state of relaxation, which eventually terminates in functional derangement. Every drop of alcohol is an absolute poison, and ardent spirit is but diluted alcohol. When introduced into the stomach, it is speedily taken up by the absorbent vessels, carried into the circulation, hurried rapidly from one organ to another, first exciting and then paralyzing them; until, at length, it is taken up by the excretory vessels and unceremoniously expelled, either by means of the pulmonary exhalants, or the depurating vessels of the skin and urinary apparatus.

These are the effects of ardent spirits when drunk in so small a quantity as not to produce inebriation. That they are powerful poisons is evident from the effects they produce when intoxication ensues. By their narcotic operation upon the nerves and brain, the drunkard is reduced to the condition of an idiot, or elevated to that of a frenzied madman. The eyes lose their lustre, and become inflamed and watery. The whole countenance exhibits an idiotical appearance, and the resolutions of the mind are weak and vacillating, or performed with indecision. The muscles lose their contractility, and the individual either sinks powerless upon the ground, or staggers from place to place, with scarcely strength enough to preserve an equilibrium.

A perseverance in these habits of debauch is followed by a long train of evils. The liver becomes diseased, and elaborates an insufficient quantity of bile, the quality of which is often impaired, giving rise to bilious complaints: frequently the liver is enlarged and indurated, and its blood-vessels, in a great measure, obliterated.



Sometimes a collection of serum in the cellular membrane of the abdomen marks the devastating course of intemperance, and the drunkard dies of dropsy. At other times, the lungs are inflamed, and tubercles form in their structure; weakened by their exertions to purify the blood, which an unnatural stimulus hurries through the air-cells of the lungs, consumption is developed, and the mis-spent life of the inebriate is terminated by this lingering disease. Or, it may be, that the unnatural and rapid circulation of an impure blood through the tender vessels of the brain, causes an extravasation of blood, or a compression of the medullary portion of the brain, and he is suddenly destroyed by an apoplectic attack. If he escapes these diseases, acute inflammation of the stomach, or dyspepsia in some of its aggravated forms, speedily produce death. That dreadful disease, delirium tremens, is peculiarly the drunkard's.

If the drunkard falls a victim to these loathsome disorders, let not the tippler, or the *temperate* drinker who boasts of never having been intoxicated, think that they escape. Thousands are destroyed by alcohol who were never drunk. But let us take the tippler, who is only occasionally intoxicated, yet regularly and daily resorts to the bottle, and we shall see if his boasted immunity from disease is founded in truth.

The first sensible effect of ardent spirits on the tippler is a loss of appetite, succeeded by a general debility and emaciation of the body. A dry husky cough and occasional head-ache are his morning companions. The nervous system is shortly affected, indicated by tremors of the hands, faltering speech, and sudden startings when a door is unexpectedly opened or any similar event occurs. The complexion assumes a sallow and sickly hue, or becomes unnaturally red, and the skin is covered with eruptions or blotches. The muscles of the face are spasmodically affected, and the joints become stiff and weakened. He loses his former animation, and his intellectual faculties are manifestly impaired. In short, dyspepsia, pleurisy, epilepsy, or some inflammatory disease, terminates his existence, while his life is embittered.



tered by frequent attacks of rheumatism, gout, hypochondriasis, palpitation of the heart, melancholy, madness, and a host of other diseases, which would swell the catalogue to a frightful extent. In an age of general reform, the abuse of ardent spirits has received universal condemnation, and time would be ill-spent to devote a larger space to the consideration of a subject, concerning which there can be but one opinion among sensible men. It would, therefore, be a useless task to quote the authority of able writers to prove a position which is self-evident, namely, that *ardent spirits are pernicious, in any quantity, during health, and that they are unnecessary, to say the least, as a medicine in disease.*

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WATER.

“Learn temperance, friends, and hear, without disdain,  
The choice of WATER. Thus the Coan sage  
Opin’d, and thus the learn’d of ev’ry school.

“No warmer cups the rural ages knew,  
None warmer sought the sires of human kind.  
Happy in temperate peace! Their equal days  
Felt not th’ alternate fits of feverish mirth  
And sick dejection.

Blest with divine immunity from ails,  
Long centuries they liv’d; their only fate  
Was ripe old age, and rather sleep than death.  
Oh! could those worthies from the world of gods  
Return to visit their degenerate sons,  
How would they scorn the joys of modern time,  
With all our art and toil improv’d to pain.”

So far has civilized man deviated from the paths of nature, that we find him rejecting, as unpalatable, so invaluable a beverage as water, and supplying its place with a variety of artificial liquors, not one of which can subserve the purposes for which water was designed.

Were water the universal beverage, those beastly habits of intemperance which have been productive of so many crimes, so much poverty and misery, would not disgrace human nature. “Honest water (says SHAKESPEARE) is too *weak* to be a sinner, it never left a man i’ the mire.” How few recollect this simple eulogy of an inestimable liquid.

We have the unqualified testimony of the most distinguished philosophers and medical authors of ancient

and modern times, that water is the most salubrious drink of which we have any knowledge.

From the time of Hippocrates to the present day, a period of more than two thousand years, a mass of testimony has been accumulated, which is overwhelming in its arguments, conclusive in its nature, and presenting the experience of some of the most disinterested philanthropists who have ever labored for the welfare of an ungrateful world.

HIPPOCRATES himself, who has been styled the "father of medicine," who lived to the age of 90 years, and who had divine honors paid to him by the Grecians, asserts, "that water is the *only* fitting drink of man."

GALEN, the venerable successor of Hippocrates, who published over 750 scientific works, and lived to the age of 140 years, advocates still more strenuously the opinion of his predecessor, recommending water as a remedy in diseases.

PLINY, the celebrated naturalist, and one of the most learned of the ancient Roman writers, remarks—"It is a great absurdity that mankind should bestow so much trouble and expense in making, artificially, such a variety of liquors, when nature has presented to their hands a drink of so *superior* a quality as *water*."

HERMAN BÖERHAAVE, a distinguished lecturer on the Theory and Practice of Medicine, at Leyden, says—"If drink be merely required for allaying thirst and dryness, and diminishing the tenacity and acrimony of the fluids, then is *cold water*, when limpid, light, without smell and taste, and obtained from a clear running stream, the best drink for a robust man."

FREDERICK HOFFMAN, professor of Physic at Halle, and deservedly esteemed one of the best writers on medicine, says—"No remedy can more effectually secure health and prevent disease than pure water. It proves agreeable to all ages, and hence we conceive the reason why the drinkers of water, provided it be pure and wholesome, are more healthy and long-lived than such as drink wine or malt liquors, and why it generally gives them a better appetite. Those who drink nothing

but water are observed to have whiter and sounder teeth than others. Add to this, that drinkers of water are brisker and more alert in all their actions, both of mind and body, than such as use malt liquors."

SIR JOHN FLOYER, an eminent English physician and medical writer, who was honored with knighthood as the reward of his talents, remarks—"The water drinkers are temperate in their actions, prudent, and ingenious; they live safe from those diseases which affect the head, such as apoplexies, palsies, pain, blindness, confusion, deafness, gout, convulsions, trembling, and madness."

"As water (says DR. BAYNARD) is, in chief, the universal drink of all the world, both animal and vegetable, so it is best and most salubrious; for, without it, no plant nor creature could long exist."

DR. ARBUTHNOT, a celebrated wit, physician to Queen Anne, and companion to Pope, to Swift, to Gay, and to Parnell, observes—"Water is *alone* the proper drink of *every* animal."

DR. WALLIS, a celebrated English medical writer, poet, and satirist, says—"Water is the most eligible beverage."

"Pure water (says DR. LEAKE) is the fluid designed by nature for the nourishment of all bodies, animal or vegetable. Water-drinkers are observed to be more healthy and long-lived than others. In such the faculties of the *body* and *mind* are more strong; their *teeth* more white; their *breath* more sweet, and their *sight* more perfect than in those who use *fermented liquors* and much *animal food*."

DR. WILLIAM CULLEN, an eminent Scotch physician and medical writer, remarks—"Simple water, therefore, as nature affords it, is, without any addition, the proper drink of mankind."

DR. GREGORY, a distinguished medical writer, says—"The sole primitive and mainly natural drink is water; which, when pure, whether from a spring or river, has nothing noxious in it."

DR. ZIMMERMAN, author of the well-known work, entitled "*Zimmerman on Solitude*," and physician to

Frederick the Great, King of Prussia, says--“ Soft water is the most suitable drink for man, since fermented liquors are rather the product of art than of nature.”

“ Water (says DR. CHEYNE) was the primitive original beverage ; and it is the only simple fluid fitted for diluting, moistening, and cooling ; the ends of drink appointed by nature. And happy had it been for the race of mankind, if other mixed and artificial liquors had never been invented. It has been an agreeable appearance to me to observe, with what freshness and vigor those who, though eating *freely of flesh-meat*, yet drank nothing but water, have lived in health, indolence, and cheerfulness, to a great age.”

“ Water drinkers (says DR. SAUNDERS) are, in general, longer lived, are less subject to decay of the faculties, have better teeth, and more regular appetites, than those who indulge in a more stimulating diluent for their common drinks.”

FAUST, physician to the reigning Count of Schaumburg Lippe, declares that “ cold water is the most proper beverage for man as well as animals—it cools, thins, and clears the blood—it keeps the stomach, head, and nerves in order—makes man tranquil, serene, and cheerful.”

“ As water (says DR. PARR) is the most ancient, so it is the best and most common fluid for drink, and ought to be esteemed the most commodious for the preservation of life and health.”

HUFELAND, physician to the King of Prussia, a professor of distinguished reputation, and editor of a medical journal, says—“ The best drink is water, a liquid commonly despised, and even considered prejudicial. I will not hesitate, however, to declare it to be one of the greatest means of prolonging life.”

“ Health (says DR. RAMSAY) is much injured by those who are frequently sipping strong liquors, though they are never intoxicated. It is a good general rule never to drink any thing but water.”

“ General Jackson (says DR. BARKER) was once asked if soldiers required ardent spirits? He replied, that he observed in hard duty and excessive cold, those



performed the one and endured the other better who drank nothing but *water*."

"The more simply (says DR. PARIS) that life is supported the better, and he is happy who considers water the best drink.

DR. KIRK maintains, that "every recent experiment demonstrates, most clearly, that men, when exposed to extreme cold and wet, endure the fatigue longer, and with less injury, upon *simple water* only, than when supplied with spirituous liquors."

"It is now before the world (says Professor EDGAR) as the result of a multitude of experiments, that the human constitution can endure longer, and more easily, intense heat and cold, hard labor, and severe privation, with water as the only drink."

"Pure water (says DR. HOFFMAN) is the best drink for persons of all temperaments: it promotes a free and equable circulation of the blood, on which the due performance of every animal function depends. Water drinkers are not only the most active and vigorous, but the most healthy and cheerful."

"Water (says DR. GARNET) is the only liquor that Nature has provided for animals; and whatever she gives is best. We ought to distinguish the real wants of nature from the artificial calls of habit."

LONDE, an eminent French physician, states, "that water is, of all drinks, that which, by its constant use, is best fitted to aid in prolonging the life of man."

"Water (says DR. ROSTAM) is the most natural drink, that of which man made use in times of primæval manners. Abstemious persons are not pale and weak as supposed—this effect only occurs when water is drunk to excess. Those who take it in moderation, enjoy, to a very high degree, the faculties, as well moral as intellectual, and often attain advanced age."

DR. MOSELY, in speaking of the diseases incident to warm climates, says—"I aver from my own knowledge and experience, as well as from the knowledge and observation of others, that those who drink nothing but water, or make it their principal drink, are but little af-

fectured by the climate, and can undergo the greatest fatigue without inconvenience."

DR. JOHNSON tells those who go to hot climates, that, "in short, the nearer you approach to a perfectly aqueous regimen, the first year at least, so much the better chance have you of avoiding sickness; and the more slowly and gradually we deviate from this afterwards, so much the more retentive will we be of that invaluable blessing—health!"

"We ought (says DR. WILlich) to drink only when we are thirsty, and to desist when thirst is quenched; but this is seldom the case, because many of our liquors stimulate the palate. Pure water, therefore, is an inestimable beverage, as it will not induce us to drink more than is necessary."

GEORGE ERNEST STAHL, a German Professor of Chemistry, of considerable celebrity, strongly advocated *water as a drink exclusively*.

ALBERT HALLER, an illustrious poet, physiologist, and natural historian, who lived 75 years, and who was considered the most acute, various, and original genius that had appeared in the medical world since the time of Boerhaave, abstained from wine from an early period of his life; his *only beverage* was *water*; and he delighted to represent the unfitness of the climate of Berne, for the culture of the grape, as a signal advantage conferred by nature on his country.

"MR. THEDAN, Surgeon General, ascribes his long life, of more than eighty years, chiefly to the daily use of a large quantity of water, which he drank for upwards of 40 years. Between his thirtieth and fortieth year, he was a most miserable hypochondriac, oppressed with the deepest melancholy, tormented with a palpitation of the heart, indigestion, &c. and imagined that he could not live six months. But from the time he commenced this watery regimen, all these symptoms disappeared; and, in the latter half of his life, he enjoyed better health than before."

DR. JACKSON, head of the Medical Staff in the British West Indies, drank nothing but *water*, and confined him-

self to a *vegetable diet*. By this means he attained an advanced age.

SIR ISAAC NEWTON, when composing his celebrated treatise upon Optics, confined himself to *water* and a *vegetable diet*; to this abstemious mode of living has been ascribed his great age, 85 years.

The illustrious JOHN LOCKE, author of the "Essay on the Human Understanding," died in the 73d year of his age; his *common drink* was *water*, which he justly considered was the cause of his life being prolonged to so great an age, notwithstanding the original feebleness of his constitution, and the distressing disease, the asthma, under which he labored for many years.

PRESIDENT EDWARDS, a divine of high intellectual attainments, and a successful author, drank nothing but *water*.

DR. FRANKLIN, the celebrated American philosopher, drank nothing but *water* for a great number of years, and was termed the American Aquatic, for refusing to partake of the malt liquors usually drank by his fellow-workmen in a London printing office.

DR. RUSH, so well known as an able writer and medical practitioner, declares that he was exposed to considerable degrees of heat and cold, and had used violent muscular exertions, and yet found pure *water* adequate to the supply of all his wants.

TOURNEFORT mentions a Venetian consul, a resident of Smyrna, who lived to the age of 118 years, and never drank any thing but *water*.

"The robust and hardy warriors of antiquity drank nothing but *water*. SAMPSON, whose drink was only *water* from the limpid brook, is a memorable example of uncommon bodily prowess, maintained by abstinence from all intoxicating drink—an abstinence to which his mother had also vowed herself."

ALEXANDER SELKIRK, who, for four years and four months was the only inhabitant of the island of Juan Fernandez, used no drink but *water*, and assured Dr. BAYNARD that he was three times as strong then as he ever was before.

**WEBB**, the noted pedestrian, who was remarkable for vigor of body and mind, lived wholly on water for his drink.

**COL. HASKET**, the American pedestrian, accomplished a distance of *two thousand five hundred miles*, on foot, during the summer months, in 70 days, living exclusively on *bread and water*, and gained two and a half pounds in weight.

I might go on to enumerate John Wesley, John Fletcher, Sir William Jones, Demosthenes, Mahomet; Euler, the celebrated mathematician; Boyle, the Father of modern Chemistry; La Place, the natural philosopher; and the great philanthropist, Howard; together with a host of the most eminent literary and philosophical men that ever existed, but why waste time to prove a self-evident, an incontrovertible fact, viz. that if Nature had intended that man should quench his thirst with any other beverage than water, that beverage would have been provided for his use. If the testimony adduced be insufficient to convince any individual capable of reasoning, then is that individual most culpably ignorant, and obstinately wedded to habit and prejudice.

It is not, however, among these individuals alone that we must look for examples of abstinence. In various parts of the world, whole families, tribes, and even nations, quench their thirst with water, and yet exhibit as abundant an amount of intellectual attainments, and vigor of bodily strength, as the bloated wine-bibber or the fashionable debauchee.

“Strange as it may appear (says the *Journal of Health*) it is not the less correct, that the large body of the laboring classes, in those countries, and in Italy, make water their common drink. Wine, however abundant it may be, is a beverage of comparative luxury to such persons. The thousands of fishermen and Lazzaroni of Naples, whose solid aliment is bread and maccaroni, and, of late years, potatoes, and whose *constant* drink is water, exhibit a strength and symmetry of frame, and ease of movement, together with a vivacity of feeling, of which their richer fellow-citizens and the noblemen,



drinkers of wine, may well envy them the possession. The hardy Arabs of the desert have no other habitual drink than water; but yet, what drinkers of wine or porter could undergo the fatigue and exposure to which they are habitually subject? Water is the constant, and we may add, only drink for millions of the inhabitants of Asia and Africa, to whom nature, in many parts of those continents, has been by no means niggardly, in physical power and symmetry of form."

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 TOBACCO.

TOBACCO is a very active *narcotic*. In the year 1559 when Jean Nicot was ambassador at the court of Lisbon from Francis II. he received, from Hernandez de Toledo, a Spanish gentleman, a small quantity of Tobacco. Jean Nicot sent some of this to Catherine de Medicis, who used it in the form of a powder. The Cardinal Santa Croce, on returning from his embassy at the Spanish and Portuguese courts, carried the plant to his own country. Sir Walter Raleigh introduced it into England on his return from America, and it soon came into general use throughout the civilized world. It met, however, with considerable opposition from the public functionaries, who attempted to discourage its use by legislative enactments.

James the first wrote a philippic against it, entitled a "Counterblaste to Tobacco," in which he says that the smoking of it is "a custome loathsome to the eye, hateful to the nose, harmefull to the brain, dangerous to the lungs; and, in the black stinking fume thereof, nearest resembling the horrible Stygian smoke of the pit that is bottomlesse." In 1604, James the first endeavored, by means of heavy imposts, to abolish its use in England, and, in 1619, he commanded that no planter in Virginia should cultivate more than 100 pounds.

"In 1624, Pope Urban VIIIth. published a decree of excommunication against all who took snuff in church. Ten years after this, smoking was forbidden in Russia, under pain of having the nose cut off. In 1653, the

Council of the Canton of Appenzel cited smokers before them, whom they punished, and they ordered all innkeepers to inform against such as were found smoking in their houses. The police regulations of Berne, made in 1661, was divided according to the Ten Commandments, in which the prohibition of smoking stands immediately beneath the command against adultery; this prohibition was renewed in 1675, and the Tribunal instituted to put it into execution (the *Chambre au Tabac*) continued to the middle of the 18th century. Pope Innocent the XIIth., in 1690, excommunicated all who were found using tobacco in the church of St. Peter at Rome. In 1719, the Senate of Strasburgh prohibited its cultivation, from an apprehension that it would diminish the growth of corn. Amuranth the IVth. published an edict which made smoking Tobacco a capital offence; this was founded on an opinion that it rendered the people infertile."

The chemical composition of Tobacco exhibits two substances, *Nicotin* and an *Essential Oil*, both of which are poisonous in the extreme. The *Nicotin* was obtained by Vauquelin from tobacco. Its use is sometimes attended with syncope, cold sweats, and death. It immediately affects the nerves by exciting them to action; an effect shortly followed by a paralysis which induces a disposition to sleep.

The *Essential Oil* is still more powerful. KÆMPFER ranks it with the strong vegetable poisons. A drop of this oil put on the tongue of a cat, produced violent convulsions, and killed her in the space of one minute. A thread dipped in the same oil, and drawn through a wound, made by a needle in an animal, killed it in the space of seven minutes. FONTANA made several experiments upon pigeons with the oil of tobacco. A small drop applied to the naked muscles of a pigeon, produced vomiting and syncope.

These effects result from the separated principles of tobacco; it remains to be shown that tobacco in its natural condition is also a powerful vegetable poison. Numerous recorded medical experiments attest this fact.

Even applying the moistened leaves over the stomach has been known to extinguish life.

“The effects of tobacco (says Dr. MACNISH) are considerably different from those of any other inebriating agent. Instead of quickening, it lowers the pulse, and, when used to excess, produces languor, depression of the system, giddiness, confusion of ideas, violent pain in the stomach, convulsions, and even death. Its essential oil is so intensely powerful, that two or three drops inserted into a raw wound, would prove almost instantly fatal. In whatever form it is used, it produces sickness, stupor, bewilderment and staggering, in those unaccustomed to its use. There is no form in which it can be taken that is not decidedly injurious and disgusting. The whole, from snuffing to plugging, are at once so utterly uncleanly and unnatural, that it is incredible in what manner they ever insinuated themselves into civilized society.”

“I have long witnessed (says Dr. AGNEW) in a variety of cases, the deleterious effects produced by the constant use of that strong narcotic, such as vertigo, indigestion, flatulence, &c. and which must necessarily be the irreparable concomitants of the application of such a narcotic stimulus to so large a portion of the nervous and secreting surface, either in substance or vapor.”

“In whatever form (says Professor HITCHCOCK) it may be employed, a portion of the active principles of the tobacco, mixed with the saliva, invariably finds its way into the stomach, and disturbs or impairs the functions of that organ. Hence, not unfrequently, those who are accustomed to the use of tobacco labor under dyspeptic symptoms. They experience at intervals a want of appetite—nausea—inordinate thirst—vertigo—pains and distensions of the stomach—disagreeable sleep, and are more or less emaciated.”

It is difficult to account for the attachment manifested to a weed, the taste and smell of which are loathsome in the extreme. Indeed, the *filthiness* of the practice is so disgusting, that it is astonishing to find *well-bred* people smoking and chewing in company—puffing their

abominable exhalations of tobacco smoke in the faces of those who dislike it, and inundating the floors, carpets, and other places with floods of saliva.

“Consider (says DR. CLARKE) how disagreeable your custom is to those who do not follow it. An atmosphere of tobacco effluvia surrounds you whithersoever you go; every article about you smells of it; your apartments, your clothes, and even your breath. Nor is there a smell in nature more disagreeable than that of stale tobacco, arising in warm exhalations from the human body, rendered still more offensive by passing through the pores, and becoming strongly impregnated with that noxious matter which was before insensibly perspired.”

There are three modes of using tobacco, smoking, chewing, and snuffing. Chewing is not only the most filthy and disgusting of the three modes, but is likewise the most destructive to health.

“By chewing (says DR. McALISTER) all its deadly powers are speedily manifest in the commencement of the practice. In this mode, too, its nauseous taste and stimulant property excite and keep up a profuse discharge from the mucous follicles and salivary glands. When we reflect that large quantities of saliva, strongly impregnated with this poison, and even particles of the substance itself, are frequently swallowed, what, I ask, is the probable condition of such a person’s digestive organs?”

“The chewing of tobacco (says one of the ablest physicians in Massachusetts) is not necessary or useful in any case that I know of.”

“This is the worst way (says DR. MACNISH) for the health in which tobacco can be used. The waste of saliva is greater than even in smoking, and the derangements of the digestive organs proportionably severe. All confirmed chewers are more than usually subject to dyspepsy and hypochondriasis; and many of them are afflicted with liver complaint, brought on by their imprudent habit.” And many instances of the fatal effects of chewing have been recorded by medical writers.



“I once lost (says Dr. RUSH) a young man of seventeen years of age, of a pulmonary consumption, whose disorder was brought on by the intemperate use of segars.”

Dr. TISSOT ascribes sudden death, in one instance, to excessive smoking.

J. BORRHÉ witnessed the dissection of a man who had been excessively addicted to the pipe, and it was found that his brain was indurated and shrivelled.

“The great virtues of a pipe (says Dr. JONES) taken in the morning fasting, are extolled by many, ‘because,’ say they, ‘it pumps up a quantity of cold phlegm from the stomach!’ Not to insist that nothing can be taken out of the stomach but by vomiting; let it be observed that the substance which is forcibly hawked up by many who have acquired this most disgusting habit, is the *mucus* secreted by the tonsils to lubricate and defend the *œsophagus*; together with the *saliva* which is secreted by the glands. And this *mucus* and *saliva* are not less requisite in their respective places than the blood itself; as they are not only absolutely necessary for the defence of the parts already mentioned, but also for the important purpose of digestion. Every medical man knows well, that the *saliva* which is so copiously drained off by the infamous *quid*, and the scandalous *pipe*, is the first and greatest agent which nature employs in digesting the food.”

“In no sense (says Dr. MACNISH) except as affording a temporary gratification, can it be justified or defended. It pollutes the breath, blackens the teeth, wastes the *saliva* which is required for digestion, and injures the complexion. In addition to this, it is apt to produce dyspepsia, and other disorders of the stomach; and, in corpulent subjects, it disposes to apoplexy. At the present moment, smoking is fashionable, and crowds of young men are to be seen at all hours walking the streets with segars in their mouths, annoying the passengers. They seem to consider it manly to be able to smoke a certain number, without reflecting that there is scarcely an old woman in the country who would not beat them

to nought with their own weapons, and that they would gain no sort of honor were they able to outsmoke all the burgomasters of Amsterdam."

The most unnatural and detestable mode of using tobacco, is in the form of snuff. In this manner it exerts all its pernicious qualities; the brain is directly subjected to its influence, and, as a consequence, the memory becomes enfeebled, and the intellectual faculties impaired. The olfactory nerves suffer in a proportionate degree; hence the sense of smelling is partially destroyed. The complexion is ruined by its use—the skin being tinged of a pale brown color. Fleshy excrescences frequently form in the nostrils, and threaten the patient with suffocation; and abscesses are produced by its use in the sinuses of the maxillary bones. It renders the hearing dull, and makes the eyes weak and watery. Almost invariably the voice is altered, and the organs of speech more or less directly affected by its use. Particles of the snuff find their way into the stomach, subjecting that organ to the influence of a powerful narcotic; hence heartburn and other symptoms of indigestion proceed from snuffing. Even using it with butter as an ointment for the cure of scald head, has produced vertigo, vomiting, fainting, and convulsions.

Many females are in the disgraceful habit of chewing Scotch snuff. At first used to cleanse the teeth, it soon becomes an indispensable habit; and respectable females find themselves under the necessity of continuing a practice which self-respect denounces as not only loathsome but indecent.

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#### OPIMUM.

OPIMUM is the concreted milky juice of the head of the poppy. This violent poison is so extensively used, in the form of pills, paregoric, laudanum, &c. and its effects on the constitution are so alarming, that it becomes a source of the deepest regret to witness the daily-increasing predilection for this noxious drug. Opium, like tobacco, is a powerful narcotic. Four or five grains of

opium, introduced into the stomach, prove a powerful poison, producing vertigo, tremors, convulsions, delirium, stupor, stertor, and, finally, fatal apoplexy.

The narcotic principle of opium has been obtained in a separate state, and has received the name of *morphia*. Morphia is a vegetable alkali, first extracted from opium in 1817, by Serturmer. It acts with great energy on the animal economy. A grain and a half taken at three different times, produced such violent symptoms upon three young men of 17 years of age, that Serturmer was alarmed lest the consequences should have proved fatal.

Opium acts directly upon the nervous power, diminishing the sensibility, irritability, and mobility of the system. It acts as a sedative, disposing more or less to sleep, while its stimulant powers have been thought to produce intoxication.

Opium is sometimes used in the form of pills; sometimes it is mixed with alcohol to form a tincture well known as laudanum; and, to the laudanum, camphor and benzoic acid are added to make paregoric.

Among females, many of whom would consider themselves irretrievably disgraced to be detected in drinking alcoholic fluids, laudanum and paregoric are resorted to, to produce an excitement analogous to intoxication. So extensively prevalent has this habit become, that apothecaries find the sale of laudanum and paregoric almost daily increasing.

“We have, indeed, (says Professor HITCHCOCK) few genuine opium eaters among us; but the laudanum and paregoric phial are considered almost indispensable in every family. Nor does the mother hesitate, night after night, to quell the cries of her infant child by administering increasing doses of these poisons, and thus almost infallibly to ruin its constitution. The nervous invalid also resorts to this remedy for allaying the irritation of his system and procuring repose. And more especially does the delicate votary of fashionable life make this her nightly resort, on returning at midnight from the assembly, the dance, or the tea party, ‘all soul within and

all nerve without.' And nearly all these persons, numerous as they have become among us, are probably ignorant that they are thus destroying themselves and their children. But if they will not listen to the following awakening warning, coming from high medical authority, they are irretrievably ruined."

"However repugnant to our feelings as rational beings may be the vice of drunkenness, it is not more hurtful in its effects than the practice of taking laudanum."—"This is not the language of exaggeration or speculative fear. We speak from a full knowledge of the facts. We repeat it—the person who gives himself up to the habit for weeks (he may not reach to months, or, if he pass these, his years will be but few and miserable,) of daily measuring out to himself his drops of laudanum, or his pills of opium, or the like deleterious substance, call it tincture, solution, mixture, potion, what you will, is destroying himself as surely as if he were swallowing arsenic, or had the pistol applied to his head. The fire of disease may for a while be concealed—he may smile incredulous at our prediction; but the hour of retribution will come, and the consequences will be terrible."

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#### CONDIMENTS.

**CONDIMENTS** are those substances which are taken with the food, either to give it sapidity, to correct its bad qualities, or to promote its digestion. They are usually divided into the saline, the sweet, the acid, the spicy or aromatic, and the oleaginous.

*Salt* is the chief saline condiment, and is held in repute by all nations; its utility, however, is questionable: it is a stimulant of no little power, and operates upon the digestive organs in promoting gastric and intestinal secretions. It should be used very sparingly, although it would be advisable to eat a small portion with our food, owing to the tendency which some articles manifest of becoming rancid in the stomach; and also with animal food, to preserve the fluids from that putrescency which the free use of flesh is said to occasion.



*Sugar* should be used under no circumstances, by those who are troubled with acidity of the stomach, or whose digestive organs are not in the best condition. Those in health should use it very sparingly, for reasons already stated in the remarks on concentrated aliments.

*Vinegar*, in small quantities, is useful to correct the disposition of animal food to putrescency, and of vegetables to flatulency. The smaller the quantity used, however, the more favorable to health.

*Pepper, mustard, ginger*, and other aromatic spices, are highly injurious, being some of the most powerful of the class of artificial stimulants.

*Salad oil* labors under the same objections that have been urged against all other oils and fat; it is exceedingly difficult of digestion, liable to rancidity, and it is a highly concentrated aliment.

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**EXERCISE.**

A PARTIAL glance at the condition of the two great divisions of society, the sedentary and the laborious, will satisfy the mind at once of the beneficial effects of exercise. Among the former class, dyspepsia, consumption, and numerous diseases of the nerves, exhibit the fatal effects of inactivity and luxury. Let us contrast the sedentary clerk with the active farmer, and the importance of exercise to health will be rendered more obvious. The clerk is generally tall and thin, his complexion pale or sallow, his muscular strength comparatively feeble, and his capability of enduring fatigue is proportionably diminished. On the contrary, the active farmer is well-proportioned, his chest broad, his stature short, and his limbs large; his complexion exhibits the ruddy tint of health, his muscular powers are great, and his capability to endure fatigue proportionably increased. This difference, however, does not depend solely upon exercise, since the fresh air, more simple diet, and other causes, are accessory in developing a strong constitution.

In writing upon the present subject, it is necessary to consider mankind as they are, not as they were. Man,

undoubtedly, if we may judge from the nudity of his skin, was designed, by nature, to inhabit a warm climate: hence, we must suppose him originally destitute of clothing, and, probably, of any thing approximating to a dwelling. The advantages which he then possessed over his successors in modern days, were two-fold. In the first place, his external skin was freely exposed to the contact of the atmospheric air, and the blood which circulates in its small capillary vessels underwent a purification analogous to that which the whole mass is subjected to in the air-cells of the lungs; add to this, that the pores of the skin were not obstructed by inspissated perspirable matter, as is now the case from the quantities of clothing which envelope our limbs. In the second place, the organs of motion were not impeded in their natural actions, either by ligatures or by superfluous covering.

In those days, exercise must have been performed in the most natural, easy, and agreeable manner. There were then no artisans confined in narrow apartments, and in constricted positions, with some of their limbs unusually developed, while others were emaciated from inactivity. There were then no mechanical employments which could interfere with a proper developement of all the muscular organs.

In those days of simplicity, man walked forth into the open air, enjoying the cool breezes and odors wafted from a thousand plants. The land, diversified by valleys and hills, afforded an agreeable variety of movements, in descending the one and surmounting the other. When hungry, he plucked his food from the trees, and, when thirsty, drank from the limpid brook. His exercise being moderate, and performed with a perfect freedom of motion, at the same time that it did not amount to painful exertion, man then reaped all the benefit from exercise which the structure of his bodily organs rendered necessary. Let those who would enjoy the advantages of exercise, imitate such habits as far as is consistent with custom and convenience; and they will that he who would enjoy health and comfort must

religiously consider it a duty, imperative under all circumstances, to take that kind of exercise every day in the open air, and for such a length of time as experience shall have demonstrated to be most salutary and agreeable to his habit of body. It is to be lamented that this is not always practicable; but yet, those unfortunate individuals whom stern necessity compels to labor at some sedentary occupation during the day, may still enjoy a share of those pleasurable feelings arising from active exercise in the open air by rising at an earlier hour.

Among the great variety of animals endowed with locomotive organs, not one can be found which prefers a life of inactivity. The young lamb and kid sport and frisk about the green fields with apparent delight. The child has every disposition to active exercise; so much so, that it will almost leap from its nurse's arms; a disposition restrained as much as possible by the customs of civilized life. While some portions of society toil too much, others labor too little; but the advantage is undoubtedly on the side of those who labor too much.

Exercise is beneficial in various ways. It facilitates the circulation of the blood through the different organs, increases the peristaltic action of the intestinal canal, and promotes a free perspiration. It invigorates and strengthens the muscles, and materially improves the condition of the excretory vessels. The intellectual faculties are benefitted by exercise; the mind becomes more clear, the judgment more sound, and the memory more retentive. It obviates, to some extent, the effects of over-feeding, a practice which the luxury of modern times has rendered very common.

The most natural exercise, and the most conducive to health, is *walking*. By this mode of exercise every limb is duly called into motion, and moving about from place to place diverts the mind and makes the exercise more agreeable. Indeed, it is not advisable to indulge in any species of exercise that is not productive of pleasure; when real fatigue ensues, we should desist, for a time, from exertion. Riding and gymnastic exercises contribute to strengthen the body and promote



the general health : but no kind of exercise should supersede walking, occasionally varied by a leap or by running. As much time as possible should be spent in the open air, not less than two hours out of twenty-four, and as much longer as the daily vocations of the individual will permit. Many who now slumber till breakfast, might arise at the dawning of day, and walk five or six miles into the country, with inconceivable advantage to their health. Those unfortunate beings who are debarred from the benefits of exercise by reason of the number of hours which they are obliged to devote to the procurance of a subsistence, should, in justice to themselves and their offspring, devote a portion of the Sabbath to exercise in the open air, which could be effected without doing violence to their devotional feelings.

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## SLEEP.

**SLEEP** is that peculiar state of the body in which the brain, and muscles, and other organs of sense and of voluntary motion, have ceased to perform their appropriate functions ; while digestion, absorption, secretion, respiration, circulation, and nutrition, are still actively engaged in recruiting exhausted energies, and repairing organic losses. Sleep merely suspends that portion of life which serves to keep up with outward objects an intercourse necessary to our existence ; while life itself is preserved by the continued action of those organs whose office it is to remove the worn-out particles of the body, and to supply the waste occasioned by their removal.

The organs of sense and of motion, from long-continued excitement, at length become insensible to the impressions of their appropriate stimuli ; to restore them to their former condition, nature has established a period of repose, corresponding, in duration, to that of their exertion ; and this state of existence constitutes sleep.

After being awake for sixteen or eighteen hours, we experience a sensation of fatigue and weakness ; our



motions become difficult, our senses blunted, and the mind loses its activity. We anxiously retire from the noise and bustle of business, to seek, in the gloom and stillness of night, that voluptuous enjoyment which nature demands for the restoration of bodily strength and mental power. Choosing that posture which requires the least effort to sustain it, our muscles gradually relax, and permit the limbs to fall into the most easy and natural position; we lose, in succession, all the senses, and when, at length, we are no longer conscious of existence, we are asleep.

During sleep, respiration becomes less frequent; the circulation diminishes; the pulse is slower and weaker; insensible perspiration, urine, and other impurities of the blood, are separated in smaller quantity; the secretions are less abundant, and digestion less rapid, while absorption and nutrition proceed with augmented energy and activity.

In this state we continue for six or eight hours; and, if sleep has been perfect, the stimulus of light through our semi-transparent eye-lids, the impressions produced by sound upon our organs of hearing, the accumulation of urine and fæcal matter, the influence of habit, and every thing that can affect the senses, assist in dispelling slumber.

The proper period for retiring to rest is shortly after light is withdrawn; but this must be regulated by the previous occupations of the day. Nature evidently designed the silence and obscurity of night as the most favorable time for repose; when the last rays of the setting sun have ceased to render external objects perceptible to the sight, and the senses are no longer under the influence of external impressions, the brain gradually becomes unconscious of material sensations, and while the means of enjoyment would be limited, indulges the propensity to sleep, which the return of light dispels, and the body is invigorated and refreshed, while the intellect is active and acute.

The quantity of sleep necessary to health gradually diminishes from birth till death. Children require longer

sleep than the aged, because the function of nutrition predominates in youth, and, during sleep, nature is engaged in the growth of the body. From six to eight hours is the greatest portion of time that should be allotted to sleep; every moment spent in bed after a certain period debilitates rather than refreshes, and the continued habit of wasting the sweetest portion of our existence in sleep, entails a punishment upon the sluggard, equalled only by the enormity of the crime.

Whatever need he may have of longer repose, a man who has determined to rise at a certain hour, will invariably awake at that time, so much is the habit under the influence of the will.

Sound, refreshing sleep can only be enjoyed, when the mind is exempt from care, anxiety, and passion; and the indulgence is more delicious in proportion as the physical powers have become exhausted by suitable exercise.

Sleep is disturbed by difficult digestion, and prevented by the excitement of stimulating drinks. If the stomach be oppressed with food, it hinders the falling of the diaphragm; the chest dilates with difficulty; the blood, arrested in its circulation through the lungs, stagnates in the right cavities of the heart, and a painful sensation succeeds, as if an enormous weight lay upon the chest, which threatens to produce immediate suffocation; the most horrid images are presented to the mind, and we awake with a start, to escape from some imminent danger: and this distressing situation, known as night-mare, invariably produced by impeded circulation through the lungs, has been attributed to lying on the back, a position that those afflicted with night-mare undoubtedly seek, because it favors respiration.

There is no error more common nor more culpable than the improper regulation of our sleeping apartments. Our bed-rooms, instead of the narrow contracted dungeons, in which we now pass a feverish existence, in the excess of filth and impurity, should be commodious and well-ventilated during the day. The pernicious custom of sleeping upon *feathers* should not be tolerated during

any season of the year ; but, a well-stuffed hair, moss, or straw mattress, is an admirable substitute, while a similar pillow is always to be preferred to one of feathers. Neither should bed-curtains be allowed, as they prevent a free circulation of the air, and counteract the benefits arising from a well-ventilated apartment.

As nearly *one-third* of our existence is spent in the bed-room, it is highly important that it should be supplied with fresh air ; for this purpose the windows may be left open summer and winter, provided that a current of air is not permitted to blow upon the bed. We should retire early to rest, taking care that the stomach is not oppressed with food, and that we do not retire too soon after the last meal. We should be cautious to divest ourselves of all tight wearing apparel, lying on one side, with the muscles relaxed as much as possible. The quantity of bed-clothes should be so regulated as not to create an undue warmth. If these precautions are properly observed, a short sleep will recruit the exhausted powers, and we shall awake, at the return of day, with a mind fresh and vigorous, and our bodily strength renewed.

Nothing, probably, tends more powerfully to produce premature old age than disturbed and unrefreshing sleep ; yet, how many of the customs of civilized life are productive of such results. The sallow face and emaciated form of the unhappy student, who leaves his bed early, and who burns his lamp late, tell a tale of sorrow : excited during the day, and disturbed by feverish dreams at night, he withers beneath the blasting touch of consumption, and a premature grave yawns to receive him.

• Dreaming is a diseased action of the nervous system, occasioned either by a disordered stomach, or by a morbid irritability of the brain ; in a perfectly healthy condition, the sleep of an individual would be, to him, a state of non-existence. Dreaming is the certain criterion of ill-health ; it is not subservient to the well-being of the animal, as other healthy actions are ; and do we not know that intemperate and diseased persons are more liable to dream than temperate and healthy ones ?

do we not also know that the laboring man sleeps soundly, while the indolent one passes a restless night, afflicted with distressing dreams?

Physiologists have not satisfactorily accounted for the phenomena of dreams, and it is unimportant, or at least unprofitable, to peruse their speculations. All that is known upon the subject, may be reduced to two general rules; when the entire brain and nervous system are in such condition as not to be sensible of impressions, then there is a total exemption from dreams; but when the senses are unconscious of impressing agents, and the brain in a state of activity, then dreams occur, and appear to be realities. It is also true that certain conditions of the organs will influence the nature of the dreams. A superabundance of the seminal fluid provokes libidinous ones; the dropsical patient dreams of waters and of fountains; while he who is suffering with an inflammatory affection, sees all things tinged with red; and the epicure, whose stomach is overloaded with food, dreams of a hideous spectre squatted upon his breast. Of the phenomenon of somnambulism, we shall say but little; urged by certain states of the brain, individuals have been known to rise in their sleep, and perform many actions to which they had been accustomed, sometimes conversing rationally, and yet, when awakened from their situation, perfectly unconscious of what they had said or done in their sleep. Functional derangement is probably the cause of such actions; or they may be occasioned by some one of those causes, such as the continued practice of lying too long in bed, and disturbed or deficient sleep, which have been known to produce idiotcy and madness.

But how shall we reprobate the practice of wasting the sweetest portion of the day in slumber? Where find words to censure the sluggard, who consumes in sleep those hours that should be devoted to activity? The sweetness and freshness of the morning air, the beauty of the landscape, irradiated by the golden beams of the rising sun, the tuneful warblings of the birds, and the renewed life and vigor of all animated and natural ob-



jects, give an interest and value to the morning hours, unequalled by any subsequent portion of the day, and should prompt every rational person to enjoy it.

“Falsely luxurious, will not man awake,  
And springing from the bed of sloth, enjoy  
The cool, the fragrant, and the silent hour  
To meditation due and sacred song ?  
For is there aught in sleep can charm the wise ?  
To lie in dead oblivion ; losing half  
The fleeting moments of too short a life ;  
Total extinction of the enlightened soul !  
Or else, to feverish vanity alive,  
Wilder'd, and tossing through distemper'd dreams !  
Who would in such a gloomy state remain  
Longer than nature craves, when every muse,  
And every blooming pleasure, wait without  
To bless the wildly devious morning walk ?”

Thus sung the poet, Thompson, and all who are in the habit of early rising, will feel and acknowledge the truth of the sentiments which he so beautifully expresses. Indeed, there is one point upon which dietetic writers, however much they may differ in other respects, universally agree, that all persons, remarkable for their longevity, have been very early risers. So beneficial is its influence upon the health, that it should be recommended to those who pursue this system of diet and regimen, to rise at day-break, and take gentle exercise, in the open air, at least an hour previous to breakfast.

#### CLEANLINESS.

It has been truly remarked, that “cleanliness is the mother of virtues ;” a maxim which seems to have been forgotten by thousands of our population. Many think that they perform their duty, if they wash their face and hands once a day, and change their linen once a week.

Should we stroll through the streets and alleys of our large cities, and visit the tenements of their inhabitants, we would be surprised to find that many of them were such receptacles of filth. In passing through the various avenues of a city, the nostrils are offended with the putrid emanations from decayed animal matter, the noxious exhalations from decomposed vegetable substances, the insufferable effluvium of slaughter-houses,

and the floating particles of matter that fill the air from innumerable manufactories. Many of the houses, too, are in the most filthy condition ; the floors, stairs, walls, areas, &c. appear as if they had never been cleansed ; the beds and bed-rooms are in a similar condition, and the tenants themselves stand as much in need of ablution and purification as their apartments. The purity of the atmosphere being thus impaired, is it surprising that the small-pox, and the typhus and yellow fevers, whose very existence owe their origin to filth, should have become so prevalent among mankind ?

“ When the saline and animal elements left by the perspiration are not duly removed by washing or bathing, they at last obstruct the pores and irritate the skin. And it is apparently for this reason, that, in the eastern and warmer countries, where perspiration is very copious, ablution and bathing have assumed the rank and importance of religious observances. Those who are in the habit of using the flesh-brush daily, are at first surprised at the quantity of white dry scurf which it brings off ; and those who take a warm bath for half an hour at long intervals, cannot fail to have noticed the great amount of impurities which it removed, and the grateful feeling of comfort which its use imparts.”

The body should be completely washed from the head to the feet as often as circumstances will allow. The tepid bath is undoubtedly the best adapted to all constitutions. As to sponging and the flesh-brush, they should only be resorted to when it is not convenient to bathe. Swimming, in pure water, is not only beneficial as an exercise, but it is also useful to cleanse the skin. Indeed, to keep up a free perspiration it is necessary that the pores of the skin should be perfectly unobstructed.

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#### CLOTHING.

THE opinion has been already advanced that man originally employed no external covering to his skin. Removed, however, from a warm climate, he has found it necessary to clothe his body as a protection against

the variations of temperature, and the extreme cold of northern latitudes. Nature, in this respect, ceases to be our guide, and prudence would dictate that philosophy should direct us, not only in the choice of apparel, but also in the quantity.

With regard to the choice of apparel, our selections must be regulated by situation, age, and habit of body. As to linen, it is an improper substance to be worn next the skin, conducting heat too rapidly from the body, and causing the pores of the skin to be clogged with perspirable matter. For the youthful and vigorous, cotton garments are the most suitable, but for the aged and infirm, flannel deserves the preference. Those who are exposed to sudden and frequent transitions of temperature, as from a warm room to the cold air, will find flannel a very comfortable and salutary article of dress.

Experience alone can teach us how to proportion the quantity of clothing to the peculiar habit of body, or to the temperature of the atmosphere. Clothing should be so regulated as to preserve, if possible, an equal temperature of the body throughout the year, and the quantity should always be diminished or increased as the weather becomes warmer or colder.

Next to protecting the body from the vicissitudes of climate, particular attention should be bestowed upon the construction of our wearing apparel; and while it is so constructed as to exhibit the graceful proportions of the body, it should be sufficiently loose to permit a perfect freedom of motion. Ligatures and bandages, when used to alter the shape, or to compress any portion of the human frame into a smaller compass, are injurious to bodily health, and destructive to beauty. It is not a little surprising where the first inventors of corsets acquired their ideas of symmetry and proportion. The diabolical purveyors of the inquisition could not have invented an engine of torture more calamitous to mankind, nor more destructive to life, than the corset. The evils of tight-lacing are as manifest as they are numerous, and deserve the serious consideration of all who are interested in the welfare of the species.

It is a common remark, that those who have narrow chests, are consumptive. Now, the very object of tight-lacing is to reduce the dimensions of the chest, and this pernicious custom, when commenced in early youth, adds but another victim to the list of premature deaths. By this means, the lungs are prevented from expanding as they would otherwise have done, the blood is imperfectly purified, and a foundation is thus laid for consumption, dyspepsia, and bilious disorders. The shoulder-blade is projected, the spine distorted, and the complexion assumes a pale and sickly hue, or is unnaturally flushed. These effects are produced in a proportionate degree, by all belts and bandages.

Not content with distorting the waist, the votaries of fashion believe that they improve its beauty by reducing the size of the foot. By wearing tight shoes, the toes, which in infancy were well-formed and flexible, become flattened and almost motionless, by some of them being pressed on the top of others. The nails often grow downward into the flesh, which they painfully inflame, while the continued pressure and friction of the shoe produces those uncomfortable excrescences called corns.

The cravat should never be worn in warm weather, since it increases the sensibility of the part which it covers to the impressions of cold, and renders the individual liable to various diseases of the throat; and by wearing it too tight, instances of fatal apoplexy have been known to occur. Garters, and all other ligatures which impede the free circulation of the blood, should always be avoided.

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#### CONCLUDING REMARKS.

In addition to the causes already adduced as tending to impair the vital functions and shorten the period of life, many others connected with the propagation of the species, such as the improper management of infants, and the lewdness and licentiousness would be improper to discuss at work, might also be cited.



Many think that if a man adopt a vegetable diet, he is therefore necessarily a Grahamite. Nothing can be more erroneous. If such an individual, whose diet is perfectly unexceptionable, should fall a victim to disease, let us first inquire whether he fulfilled all that is requisite to preserve health ; whether he paid proper attention to cleanliness of person and of clothing, took exercise in the open air, kept regular hours, and exerted a proper control over his passions. If such is ascertained to be the fact, then may we conclude that there is something faulty in the system itself—but not till then. It has been objected that a majority of those who pursue this mode of living, are remarkably small and thin. That many of them are so is not denied, but it must be recollected that they were mostly invalids who adopted it, with the view of a restoration to health ; but an individual cannot be found, who, having followed this plan strictly, has not increased in weight.

Those who are desirous of longevity, need scarcely be told that a good-natured cheerful disposition contributes wonderfully to that end. Melancholy people are not only unhappy themselves, but cast a gloom on all around them ; eventually their health is seriously impaired, and life shortened. A perfect tranquility of mind, and an equable temper, are the natural results of temperate living in children ; but in the adult, the mildest diet sometimes fails to soften the fierce passions of his breast. Anger, fear, grief, and other passions seriously disturb the nervous system, and, in many instances, have produced sudden death. Anxiety, care, and chagrin, and more particularly that unconquerable restlessness and dissatisfaction, a loathing of life and its pleasures, which are so painfully manifest in many unhappy individuals, exert a powerful influence upon the brain, which frequently terminates in idiotcy or madness.

Sound, perfect teeth are absolutely necessary to a good digestion. To preserve them from the consequences resulting from an accumulation of tartar, they should be cleansed every day with pure soft water, and a good tooth-brush ; the brush should be passed over

the inside of the teeth as well as the outside. There is no need of using any dentrifice to cleanse the teeth, for all acids corrode the enamel, and powders destroy it by friction; soft water will make the teeth perfectly white and clean, and can do them no possible injury. If the gums bleed when the brush is passed over the teeth, have the tartar immediately removed; or if any of the teeth are decayed, instant application should be made to a dentist, in order to have such as were necessary, extracted, and cavities in others, filled.

## TESTIMONIALS.

For the benefit of those who are undecided or wavering, or who have but little conception of the advantages resulting from the plan of living proposed in the preceding pages, I subjoin the following testimonials from respectable individuals, whose experience is the only answer necessary to refute the charges preferred against a system, the truth of which, it is to be hoped, will one day be universally acknowledged, and the plan itself extensively practised.

That the return to a natural mode of life will not only prevent disease, but also cure those disorders which have not too far progressed, admits of abundant proof: this great truth, theoretically promulgated, has now been demonstrated by experiments of the most unequivocal nature. The individuals who have subscribed their names to the subjoined testimonials, are referred to in proof of the assertion; and, if necessary, many others might be cited.

Some of these individuals had been afflicted with obstinate chronic maladies for years; they had employed able physicians, and tried various remedies for the cure of their disorders, but with little or no success. Despairing of ever effecting a restoration to health by the aid of medicine, they adopted the plan of living which Mr. Graham had recommended, and abandoned their medical prescriptions. From the moment that they commenced this course of regimen, a gradual change took place in the state of their health, which they finally recovered, much to the surprise of their relatives and acquaintances, who had confidently predicted that they would not long survive the experiment. A few of those who had thus happily regained their health, carelessly relapsed into their former habits, and a recurrence of the diseases which had been removed, eventually followed; no relief could be obtained, until they resumed their temperate mode of life. Among these disorders the most conspicuous were consumption, dyspepsia, and a variety of nervous ailments and bilious complaints.

New-York, Dec. 12th, 1834.

Sir—

In compliance with your request, we very willingly annex our names to those which you have already received, in testimony of the benefits resulting from the anti-stimulating system of Dietetics as taught by Mr. Graham. We have followed this plan of living for the two years past, with very manifest advantage to our health and happiness, and we confidently recommend its adoption, especially to those persons who lead sedentary lives, or who are afflicted with chronic disease; being, at the same time, confident that all men would be benefitted by practicing the general doctrines of this system.

**SOLYMAN BROWN, 4 Park-Place.**

**ELEAZAR PARMLY, 11 Park-Place.**

**J. PARMLY, 11 Park-Place.**

**JOHN BURDELL, 69 Chambers-street**

**JOSEPH PERKINS, 4 John-street.**

**ELIHU BLAKE, 7 Park-Place.**

**WILLIAM MITCHELL, 124 Canal-street.**

**THOMAS D. EARLE, 124 Canal-street.**

**DANIEL PIKE, 166 Broadway.**

**DAVID I. BURGER, corner of Pell and Mott streets.**

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New-York, October 10th, 1833.

Sir—

For the sake of human happiness I venture to speak the truth, however heterodox my opinions may seem, when compared with those that are now prevalent among such individuals as are esteemed the most enlightened, in their moral and political views. My dietetic experience, then, has most satisfactorily proven to my own, as well as to the minds of several friends who have been induced, by my representations, to try, to a great extent, the plans which I had adopted, that the plainest kind of food, and that which comprises the least variety at a meal, is, beyond a doubt, calculated to insure an exemption from either physical or mental lethargy, or disease; and further, that a comparison of the effects that generally ensue from the use of vegetable and animal aliments, entitles the former to a high and decided preference:—while, to speak in more particular terms, I feel at liberty to refer yourself and others to my own immediate experience of five years, during which period I adhered strictly to a vegetable diet, to the exclusion of all articles generally considered as stimulants; my food consisting often of the coarsest bread, made from unbolted flour, or, of rice, potatoes, and such farinaceous vegetables as the season afforded. And it may be proper here to remark, that I did not commence this abstemious course on account of any diseased condition of the system, but purely from conscientious scruples; not only with regard to the injustice and cruelty of destroying animal existence, without being able to prefer the argument of necessity, but also in consideration of the injurious effects produced by the undue stimulation, resulting from the use of animal food, upon the moral and intellectual state of mankind, of which prejudicial tendency I had become convinced from a critical, and, I think, an impartial perusal of several scientific works of acknowledged merit. And, indeed, independently of the benefits that I have derived in an economical point of view, my subsequent experience has fully confirmed me in the conclusion, that I was neither premature nor injudicious in the adoption of sentiments, thus far favorable to temperance, which, if you can admit my version, is “the only point where human bliss stands still, and tastes the good without the fall to ill.”

**LAVINIA D. WRIGHT, 65 Bowery.**

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New-York, October 6th, 1833.

Sir—

As you wish me to inform you respecting my experience in living on a vegetable diet, I can only say that my experience is all in its favor



I have lived very strictly on vegetables for five years during the last twelve, and can assure you that my health is much better, and my strength far greater, than when I used a mixture of animal food; and I am thoroughly convinced that when this subject is rationally and philosophically investigated (if ever that time should arrive) that truth will be found on the side of the vegetable system, and the adoption of that system would tend greatly to the melioration of the condition (both physical and moral) of mankind. With regard to drinks, I could observe that I use only pure water, which is the only natural beverage of human race.

AMOS POLLARD, M. D.

[I subjoin the following remarks from Dr. Everett.]

New-York, December 10th. 1834.

Sir—

In compliance with your request to state my opinion of the comparative value of a diet of animal or vegetable food, to persons in delicate health, I would say, that from observation of the effects of the two systems on myself and friends, the result shows that a decided preference should be given to a diet regulated by the principles laid down in your work. Animal food does not appear to be a suitable article for the consumption of persons of sedentary habits, and particularly those who are predisposed to, or laboring under, pulmonary affections. This class of persons will find that the evils arising from confinement to the house, and neglect of exercise in the open air, will be much less apparent from the use of a vegetable diet, than one composed, even in part, of animal food.

WILLIAM EVERETT, 4 Mott-street.

New-York, December 15th, 1834.

I cheerfully add my testimony in favor of the system taught by Mr. Graham, being convinced that its adoption conduces to the health and happiness of our species. A vegetable diet may, from my own experience and observation, be recommended to all who prefer tranquility of mind to a heated and disordered circulation, which, in every instance, may be said to arise from irregularity of living, a free use of animal food, and an indulgence in stimulating drinks.

WILLIAM SHARROCK, Bleecker-street.

Sir—

Unhesitatingly do I give my testimony in favor of the well-tested principles of Mr. Graham. There can be no serious mistake in them, for they are founded in the immutable laws of nature. Nearly four years un-deviating practice, together with the daily observance of their effects on multitudes, have placed them beyond the shadow of a doubt. Go on—Truth is all powerful and must prevail; and, while the “despisers are wandering and perishing,” be yours the consolation of having done what you could to enforce these powerful truths on a degenerated world.

ASENATH NICHOLSON, cor. of Broadway and Wall-st.

New-York, December 13th, 1834.

We, the subscribers, being desirous of promoting the health and happiness of mankind, annex our names to the testimonial offered for our approbation, believing, not only from observation, but also from experience, that the principles of diet and regimen, as taught by Mr. Graham, are conducive to health. And that ourselves, and many of our friends, have experienced the benefits arising from a total abstinence from all artificial stimuli. And further, that we believe that the general adoption of a vegetable diet would tend, in a remarkable degree, to meliorate the condition of mankind, both physical and moral.

HARVEY SPENCER, 22 Cliff-street.

JOSEPH W. HARRISON, 285 Division-street.

TEMPLE FAY, 180 Franklin-street.

## TESTIMONIALS.

GURDON DAVISON, 165 Bowery.  
EVANDER D. FISHER, 341 Grand-street.  
SAMUEL HISCOX, 53 Vesey-street.  
HARIOT WHEELER, 261 Bowery.  
LEWIS SEYMOUR, 33 Mott-street.  
FRANCIS J. SMITH, 195 Madison-street.  
WILLIAM TUNIS, 69 Mulberry-street.  
CALDWELL G. WHITE, 88 Broadway.  
WALTER P. DOE, 122 Pearl-street.  
HORACE GREELY, 20 Nassau-street.  
JOSEPH T. SANGER, 194 Pearl-street.  
JOSEPH TITCOMB, 196 Broadway.  
JOHN SNIFFEN, 156 Rivington-street.  
JOSEPHUS N. CRAIN, 201 Walker-street.  
EBEN WHITNEY, 380 Pearl-street.  
GEORGE CRAGIN, 176 Thompson-street.  
MARY F. CRAGIN, 176 Thompson-street.  
RICHARD CUNNINGHAM, 159 Bleecker-street.  
JOSHUA GEER, 193 William-street.  
ELIZA WHITTELSEY, 239 Madison-street.  
EDMOND VAN YORX, 89 Clinton-street.  
CORNELIA BURR, 217 Canal-street.  
ABBY ANN BURR, 217 Canal-street.  
D. W. BELL, 249 Broome-street.  
GEORGE M. TRACY, 116 William-street.  
STELLA L. TRACY, 116 William-street.  
ANDREW LUKE, 352 Broadway.  
ASA R. LOWELL, 352 Broadway.

## EXPLANATIONS.

*Acute disease*, sudden and violent.

*Anthropophagi*, cannibals ; men who devour human flesh.

*Auricle*, one of the superior cavities of the heart.

*Blanched*, bleached or made white.

*Chronic disease*, of gradual commencement and of long standing.

*Chyle*, the nutritious fluid separated from the food for the formation of the blood.

*Chyme*, the pultaceous mass formed by the digestion of the food in the stomach.

*Congenital*, belonging to the same race or kind.

*Corpuscle*, a small body ; a particle of matter.

*Crisis*, constitution.

*Crimped*, shrunk by compression.

*Crustaceous*, having a crust-like shell or covering.

*Cuisine*, kitchen or cookery.

*Depuration*, the act of cleansing ; purifying

*Edible*, eatable.

*Elaborating*, forming with labor or precision.

*Empyreumatic*, smelling as if burned.

*Eructations*, belchings.

*Fæcal*, excrementitial.

*Fauces*, a cavity behind the tongue, &c.

*Follicles*, small bags ; applied to glands, as the salivary glands, &c.

*Graminivorous*, feeding on grass.

*Herbivorous*, feeding on herbs.

*Homogeneous*, uniform ; of a like kind.

*Hypochondriacal*, affected with lowness of spirits.

*Lacteals*, small vessels that convey the chyle to the blood-vessels.

*Laminae*, thin plates.

*Lotophagi*, men who subsisted on the *lotus*, a fruit which was said to be so delicious, that those who once tasted of it, forsook all other desires.

*Lymphatics*, small vessels that convey the lymph, &c. to the blood-vessels.

*Mammalia*, that class of animals which suckle their young.

*Median line*, the middle line, or that line which separates the right and left portions of the body.

*Molecules*, atoms, or the smallest divisible parts of matter.

*Morbid*, diseased.

*Narcotic*, stupifying.

*Ophisophagi*, men who feed on serpents.

*Parieties*, side-walls.

*Physiology*, a discourse on natural objects.

*Plexus*, a number of nervous cords woven together.

*Ponderable*, weighty.

*Pulmonary*, belonging to the lungs.

*Ruminantia*, a class of animals which chew the cud.

*Secretion*, a separation of certain particles from the blood.

*Sentient*, feeling.

*Septic*, relating to putrefaction.

*Septum*, a partition.

*Stimulus*, that which imparts increased action to an organ.

*Tissue*, a particular arrangement of nervous or muscular fibres in the organs.

*Troglodites*, men who live in caves.

*Tympanum*, the drum of the ear.

*Vacuum*, a space void of matter.

*Vascular*, consisting of vessels, as the arteries, veins, &c.

*Ventricle*, one of the inferior cavities of the heart.

*Viscera*, the internal organs, including the intestinal canal, liver, spleen, lungs, pancreas, &c.







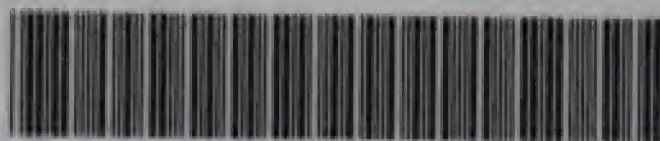












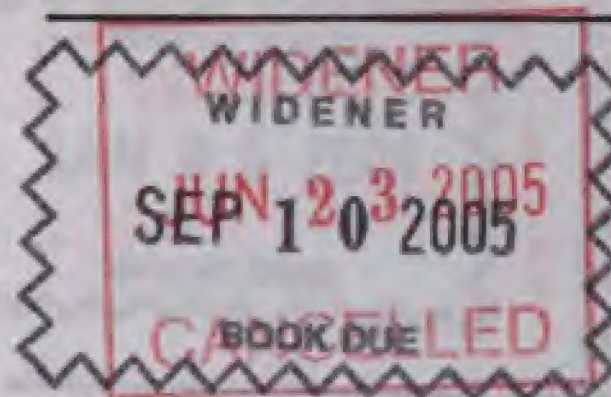
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